

Instruction manual

- This section is extracted and printed from Instruction Manual.
- If you find out “Refer to page ●●” in them, this page means not page in Service manual but page in the lower corner of each page in the extract from Instruction Manual.
This page number is not corresponded with serial number in Service manual.
- **Please note the extracted Instruction Manual which corresponds to the initial unit production, so the contents may be revised in future.**



INSTRUCTION MANUAL

MDF-U500VX MDF-U500VXC

Ultra-Low Temperature Freezer



CONTENTS

INTRODUCTION	P. 2
PRECAUTIONS FOR SAFE OPERATION	P. 3
ENVIRONMENTAL CONDITIONS	P. 7
FREEZER COMPONENTS	P. 8
Control panel	P. 10
REMOTE ALARM TERMINAL	P. 11
AIR INTAKE PORT	P. 11
INSTALLATION SITE	P. 12
INSTALLATION	P. 13
START-UP OF UNIT	P. 14
Operation after power failure	P. 14
FUNCTION OF CONTROL PANEL	P. 15
BASIC SCREEN OF CONTROL PANEL	P. 16
RUNNING OPERATION (MENU/Set)	P. 17
Chamber temperature setting (Temperature)	P. 18
Alarm temp. setting (High Alarm/ Low Alarm)	P. 19
Alarm delay time setting (Alarm Delay)	P. 20
Ring back of alarm buzzer setting (Ring Back)	P. 21
Key lock function	P. 22
Key lock release function	P. 23
VARIOUS SETTING (MENU/Log)	
Display of log (Log)	P. 24
Indication of log and transmission	P. 25
VARIOUS SETTING (MENU/Tools)	
Initialization (Tools/ Default Setting)	P. 27
Set of date, time, log interval (Tools/Date Time)	P. 28
Set of door alarm delay time (Tools/Door Delay)	P. 29
Set of log interval (Tools/Log Interval)	P. 30
Change of compressor delay time (Tools/Comp. Delay)	P. 31
Set of key lock password (Tools/Key Lock PW Setting)	P. 32
ALARM BUZZER	P. 32
MONITOR OF FREEZER STATUS	P. 33
ALARMS & SAFETY FUNCTIONS	P. 34
ROUTINE MAINTENANCE	
Cleaning of cabinet	P. 36
Defrosting of inside wall	P. 36
Cleaning of air intake port	P. 37
REPLACEMENT OF BATTERY	P. 38
TROUBLESHOOTING	P. 39
DISPOSAL OF UNIT	P. 40
Recycle of battery	P. 40
TEMPERATURE RECORDER (OPTION)	P. 45
BACK-UP SYSTEM (OPTION)	P. 47
MOUNTING OF INTERFACE BOARD (OPTION)	P. 48
MOUNTING OF LAN INTERFACE BOARD (OPTION)	P. 49
SPECIFICATIONS	P. 50
PERFORMANCE	P. 51
SAFETY CHECK SHEET	P. 52

INTRODUCTION

- Read this manual carefully before using the appliance and follow the instructions for safety operation.
- Sanyo never guarantee any safety if the appliance is used for any objects other than intended use or used by any procedures other than those mentioned in this manual.
- Keep this manual in an adequate place to refer to it as necessary.
- The contents of the manual will be subjected to change without notice due to the improvement of performance or functions.
- Contact Sanyo sales representative or agent if any page of the manual is lost or page order is incorrect.
- Contact Sanyo sales representative or agent if any point in this manual is unclear or if there are any inaccuracies.
- No part of this manual may be reproduced in any form without the expressed written permission of Sanyo.



CAUTION

SANYO guarantees the product under certain warranty conditions. SANYO in no way shall be responsible for any loss of content or damage of content.

PRECAUTIONS FOR SAFE OPERATION

It is imperative that the user complies with this manual as it contains important safety advice.

Items and procedures are described so that you can use this unit correctly and safely. If the precautions advised are followed, this will prevent possible injury to the user and any other person.

Precautions are illustrated in the following way:


WARNING


Failure to observe WARNING signs could result in a hazard to personnel possibly resulting in serious injury or death.


CAUTION

Failure to observe CAUTION signs could result in injury to personnel and damage to the unit and associated property.

Symbol shows;

 this symbol means caution.

 this symbol means an action is prohibited.

 this symbol means an instruction must be followed.

Be sure to keep this manual in a place accessible to users of this unit.

< Label on the unit >



This mark is labeled on the cover in which the electrical components of high voltage are enclosed to prevent the electric shock.

The cover should be removed by a qualified engineer or a service personnel only.















WARNING

As with any equipment that uses N₂ gas, there is a likelihood of oxygen depletion in the vicinity of the equipment. It is important that you assess the work site to ensure there is suitable and sufficient ventilation. If restricted ventilation is suspected, then other methods of ensuring a safe environment must be considered. These may include atmosphere monitoring and warning devices.

PRECAUTIONS FOR SAFE OPERATION
















WARNING

-  **Do not use the unit outdoors.** Current leakage or electric shock may result if the unit is exposed to rain water.
-  **Only qualified engineers or service personnel should install the unit.** The installation by unqualified personnel may cause electric shock or fire.
-  **Install the unit on a sturdy floor and take an adequate precaution to prevent the unit from turning over.** If the floor is not strong enough or the installation site is not adequate, this may result in injury from the unit falling or tipping over.
-  **Never install the unit in a humid place or a place where it is likely to be splashed by water.** Deterioration of the insulation may result which could cause current leakage or electric shock.
-  **Never install the unit in a flammable or volatile location.** This may cause explosion or fire.
-  **Never install the unit where acid or corrosive gases are present** as current leakage or electric shock may result due to corrosion.
-  **Always ground (earth) the unit to prevent electric shock.** If the power supply outlet is not grounded, it will be necessary to install a ground by qualified engineers.
-  **Never ground the unit through a gas pipe, water main, telephone line or lightning rod.** Such grounding may cause electric shock in the case of an incomplete circuit.
-  **Connect the unit to a power source as indicated on the rating label attached to the unit.** Use of any other voltage or frequency other than that on the rating label may cause fire or electric shock.
-  **Never store volatile or flammable substances** in this unit if the cylinder cannot be sealed. These may cause explosion or fire.
-  **Do not insert metal objects such as a pin or a wire into any vent, gap or any outlet on the unit.** This may cause electric shock or injury by accidental contact with moving parts.
-  **Use this unit in safe area when treating the poison, harmful or radiate articles.** Improper use may cause bad effect on your health or environment.
-  **Turn off the power switch (if provided) and disconnect the power supply to the unit prior to any repair or maintenance** of the unit in order to prevent electric shock or injury.
-  **Do not touch any electrical parts (such as power supply plug) or operate switches with a wet hand.** This may cause electric shock.







PRECAUTIONS FOR SAFE OPERATION

WARNING

-  **Ensure you do not inhale or consume medication or aerosols** from around the unit at the time of maintenance. These may be harmful to your health.
-  **Never splash water directly onto the unit** as this may cause electric shock or short circuit.
-  **Never put cylinders with liquid on the unit** as this may cause electric shock or short circuit when the liquid is spilled.
-  **Never bind, process, or step on the power supply cord, or never damage or break the power supply plug.** A broken supply cord or plug may cause fire or electric shock.
-  **Do not use the supply cord if its plug is loose.** Such supply cord may cause fire or electric shock.
-  **Never disassemble, repair, or modify the unit yourself.** Any such work carried out by an unauthorized person may result in fire, or electric shock or injury due to a malfunction.
-  **Disconnect the power supply plug if there is something wrong with the unit.** Continued abnormal operation may cause electric shock or fire.
-  **When removing the plug from the power supply outlet, grip the power supply plug, not the cord.** Pulling the cord may result in electric shock or fire by short circuit.
-  **Disconnect the power supply plug** before moving the unit. Take care not to damage the power cord. A damaged cord may cause electric shock or fire.
-  **Disconnect the power plug when the unit is not used for long periods.** Keeping the connection may cause electric shock, current leakage, or fire due to the deterioration of insulation.
-  **If the unit is to be stored unused in an unsupervised area for an extended period, ensure that children do not have access and that doors cannot be closed completely.**
-  **The disposal of the unit should be accomplished by appropriate personnel.** Remove doors to prevent accidents such as suffocation.
-  **Do not put the packing plastic bag within reach of children** as suffocation may result.

PRECAUTIONS FOR SAFE OPERATION

CAUTION

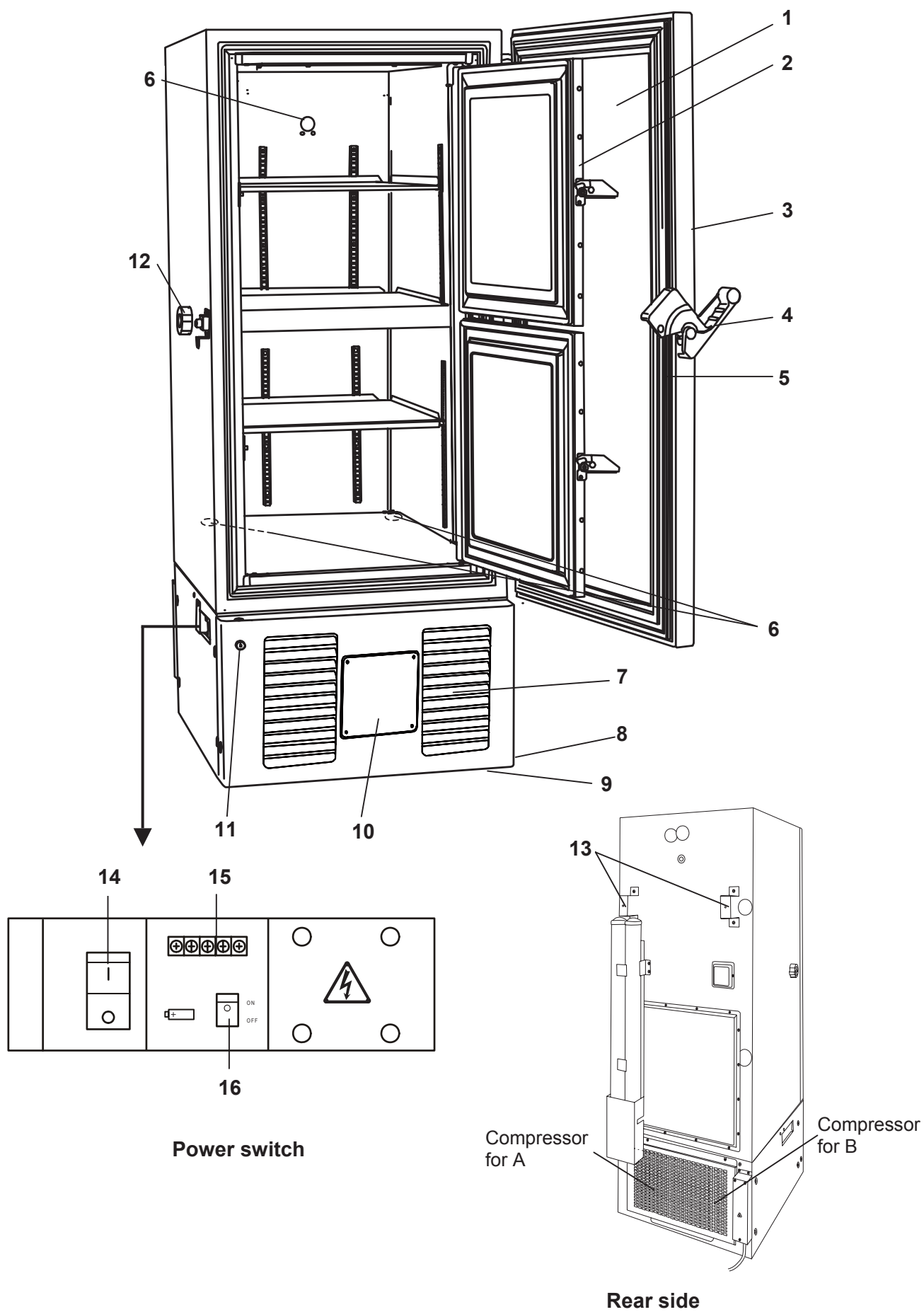
-  **Use a dedicated power source** (a dedicated circuit with a breaker) as indicated on the rating label attached to the unit. A branched circuit may cause fire resulting from abnormal heating.
-  **Connect the power supply plug to the power source firmly after removing the dust on the plug.** A dusty plug or improper insertion may cause a heat or ignition.
-  **Never store corrosive substances such as acid or alkali** in this unit if the cylinder cannot be sealed. These may cause corrosion of inner components or electric parts.
-  **Check the setting when starting up of operation after power failure or turning off of power switch.** The stored items may be damaged due to the change of setting.
-  **Be careful not to tip over the unit** during movement to prevent damage or injury.
-  **Prepare a safety check sheet** when you request any repair or maintenance for the safety of service personnel.

ENVIRONMENTAL CONDITIONS

This equipment is designed to be safe at least under the following conditions (based on the IEC-61010-1):

- Indoor use;
- Altitude up to 2000 m;
- Ambient temperature 5°C to 40°C
- Maximum relative humidity 80% for temperature up to 31°C decreasing linearly to 50% relative humidity at 40°C;
- Mains supply voltage fluctuations not to exceed $\pm 10\%$ of the nominal voltage;
- Other supply voltage fluctuations as stated by the manufacturer;
- Transient overvoltages according to Installation Categories (Overvoltage Categories) II; For mains supply the minimum and normal category is II;
- Pollution degree 2 in accordance with IEC 60664.

FREEZER COMPONENTS

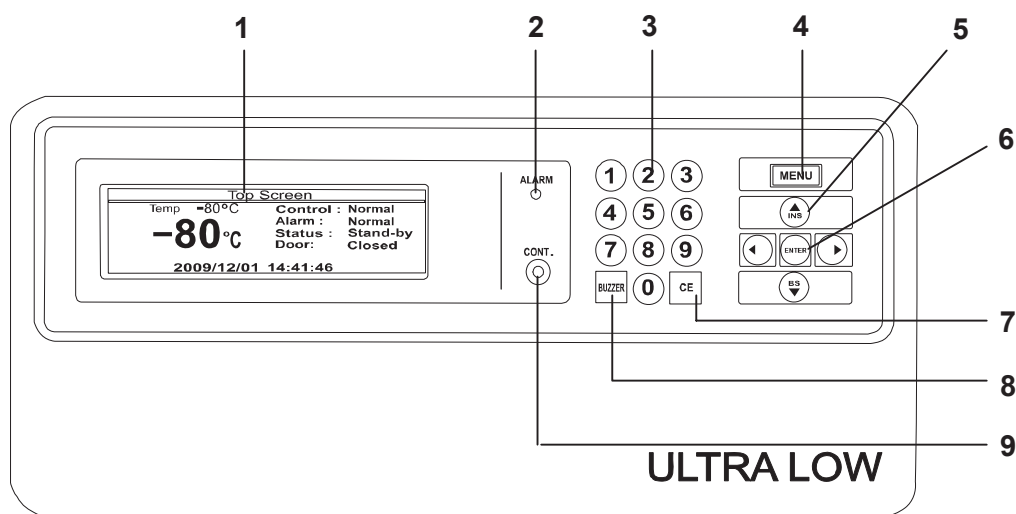


FREEZER COMPONENTS

- 1. Outer door:** To open the door, grip the handle. On closing, lock the door latch completely.
- 2. Inner door:** The operation of the inner door should be quick to minimize the temperature rise in chamber. Lock the door latch completely when the door is closed. The door is removable for cleaning or defrosting. See page 36 "Routine maintenance".
- 3. Control panel (on the upper front of the door):** Used for temperature setting and indication of operating status is displayed on the panel. See page 10 for details.
- 4. Door latch:** Always lock the latch when the outer door is closed.
- 5. Magnetic door gasket:** This provides a tight door seal and prevents cold air leak. Keep clean.
- 6. Access port (rear and bottom):** This is used for leading a cable and sensor of a measuring equipment, or nozzle of back-up system to chamber.
- 7. Air intake vent (grille):** Do not block this vent to keep the proper cooling performance.
- 8. Caster:** 4 casters are provided to facilitate moving of the cabinet. For the installation, adjust the leveling foot so that the front 2 casters cannot contact with the floor.
- 9. Leveling foot:** The height of the freezer can be adjusted by this screw type foot. Keep the unit in level at the installation.
- 10. Space for temperature recorder:** An automatic temperature recorder (optional component) can be attached here. See page 45 "Temperature recorder (Option)".
- 11. Lock:** Turn clockwise to 180° with a key and the outer door is securely locked.
- 12. Air intake port:** After closing the outer door, if used to open soon. See page 11
- 13. Fixture (on back side):** 2 fixtures are provided as spacers between the cabinet and wall and also serve as hooks to fix the unit. See page 13 "Installation".
- 14. Power switch:** This is for turning ON/OFF the power to the unit. ON – "I" OFF – "O"
- 15. Remote alarm terminal:** This is used to notice an alarm condition of the unit to remote location. Refer to page 11 "Remote alarm terminal".
- 16. Battery switch:** This is a switch for a battery for power failure alarm. Normally, turn on this switch. Be sure to turn off this switch if the freezer is not in operating for the long period (over one month).

FREEZER COMPONENTS

Control panel



1. LCD panel

2. Alarm lamp (ALARM): This lamp is flashed during alarm condition.

3. Figure input key:

4. Menu button (MENU): To open the menu window during setting.

5. Shift key (Upward, downward, rightward, leftward): To move the cursor on the LCD panel during setting.

6. Enter key (ENTER): To determine the selection of parameter during setting.

7. Clear key (CE): To clear the input value during setting or to return to the top screen after setting.

8. Alarm buzzer stop key (BUZZER): This key has three functions as follows:

- Buzzer stop key : To silence the audible alarm under alarm condition, press this key. Refer to page 33, 34 and 35 for the details.

- Alarm test key: By pressing this key for 5 seconds during normal operation, the alarm lamp blinks, the buzzer sound and the remote alarm activate. Pressing this key again finishes the alarm test. Refer to page 15 as well.

- Chamber temperature display key: The chamber temperature is displayed by pressing this key during power failure.

9. LCD contrast adjusting knob (CONT.): To adjust the contrast of LCD panel.

REMOTE ALARM TERMINAL

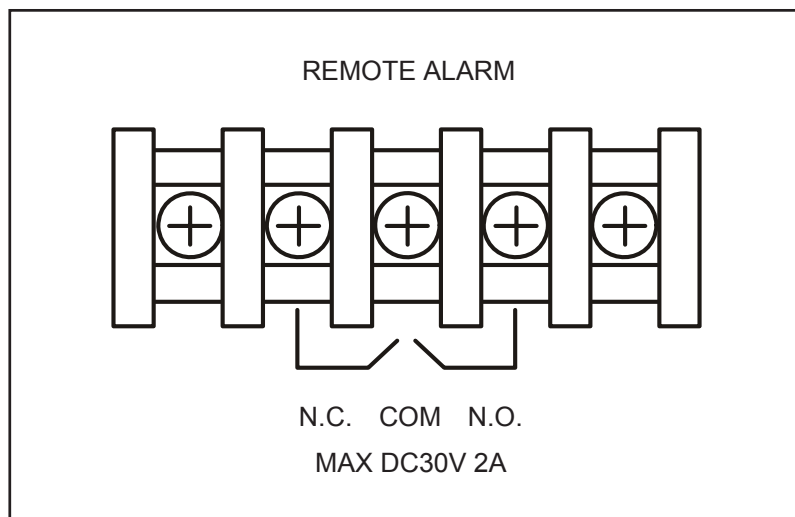
The terminal of the remote alarm is installed at the lower left side of the unit. The alarm is outputted from this terminal. Contact capacity is DC 30 V, 2 A.

Contact output:

	between COM. and N.O.	between COM. and N.C.
At normal	Open	Close
At abnormal	Close	Open

Note:

The alarm is actuated when the power cord is disconnected from the outlet or the power switch is OFF.



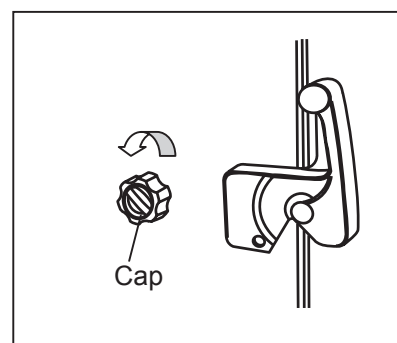
AIR INTAKE PORT

When a door is closed and opened soon, a door does not sometimes open this product.

The warm air which went into the chamber is cooled down rapidly, and this is because air inside the chamber contracted.

When a door is closed and opened soon, a door is easy to open with the following process.

1. Turn the cap of the left side counterclockwise, and remove it.
2. Put the air into the chamber from about ten for twenty seconds, and open a door.
3. Close a cap if a door opens.



A door may not open in the above method when there are frost and ice in the air intake port. In that case, open a cap, and investigate the matter whether there is no frost inside the air intake port. Remove frost inside the air intake port in "the air intake port cleaning stick" of the accessories when there is frost. Clean a air intake port every month even when there is no frost inside the air intake port. Refer to page 37.



WARNING

For removing the frost of the air intake port, do not use a tool with sharp edge such as a knife or a screw driver.

INSTALLATION SITE

To operate this unit properly and to obtain maximum performance, install the unit in a location with the following conditions:

■ **A location not subjected to direct sunlight**

Do not install the unit under direct sunlight. Installation in a location subjected to direct sunlight cannot obtain the intended performance.

■ **A location with adequate ventilation**

Leave at least 10 cm around the unit for ventilation. Poor ventilation will result in a reduction of the performance and consequently the failure.

■ **A location away from heat generating sources**

Avoid installing the unit near heat-emitting appliances such as a heater or a boiler etc. Heat can decrease the intended performance of the unit.

■ **A location with little temperature change**

Install the unit under stable ambient temperature. The allowable ambient temperature is between -5 and +35°C.

■ **A location with a sturdy and level floor**

Always install the unit on a sturdy and level floor. The uneven floor or tilted installation may cause failure or injury. Install the unit in stable condition to avoid the vibration or noise. Unstable condition may cause vibration or noise.



WARNING

Install the unit on a sturdy floor. If the floor is not strong enough or the installation site is not adequate, this may result in injury from the unit falling or tipping over.

Select a level and sturdy floor for installation. This precaution will prevent the unit from tipping. Improper installation may result in water spillage or injury from the unit tipping over.

■ **A location not prone to high humidity**

Install the unit in the ambient of 80% R.H. or less humidity. Installation under high humidity may cause current leakage or electric shock.



WARNING

Do not use the unit outdoors. Current leakage or electric shock may result if the unit is exposed to rain water.

Never install the unit in a humid place or a place where it is likely to be splashed by water. Deterioration of the insulation may result which could cause current leakage or electric shock.

■ **A location without flammable or corrosive gas**

Never install the unit in a flammable or volatile location. This may cause explosion or fire or may result in the current leakage or electric shock by the corrosion of the electrical components.

■ **A location without the possibility of anything fall**

Avoid installing the unit in the location where anything can fall down onto the unit. This may cause the breakdown or failure of the unit.

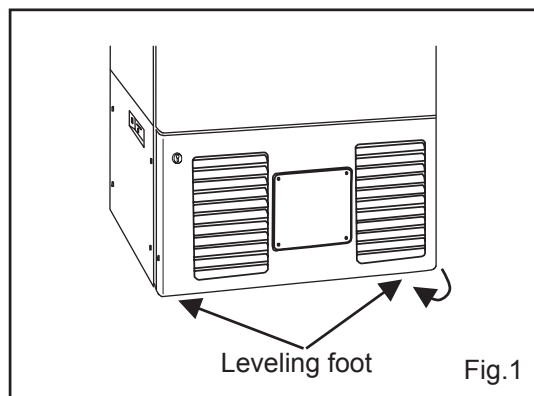
INSTALLATION

1. Remove the packaging materials and tapes

Remove all transportation packaging materials and tapes. Open the doors and ventilate the unit. If the outside panels are dirty, clean them with a diluted neutral dishwashing detergent. (Undiluted detergent can damage the plastic components. For the dilution, refer to the instruction of the detergent.) After the cleaning with the diluted detergent, always wipe it off with a wet cloth. Then wipe off the panels with a dry cloth.

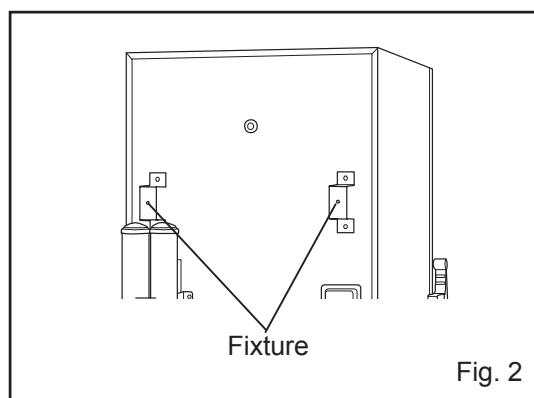
2. Adjust the leveling foot

Extend the leveling feet by rotating them counterclockwise to contact them to the floor. Ensure the unit is level. (Fig.1)



3. Fix the unit

Two fixtures are attached to the rear of the frame. Fix the frame to the wall with these fixtures and rope or chain. (Fig. 2)



WARNING

Use a power supply outlet with ground (earth) to prevent electric shock. If the power supply outlet is not grounded, it is necessary to install a ground by qualified engineers.

Never ground the unit through a gas pipe, water main, telephone line or lightning rod. Such grounding may cause electric shock in the case of an incomplete circuit.

START-UP OF UNIT

Follow the procedures for the initial and consequent operations of the unit.

1. Connect the power cord to the dedicated outlet having appropriate rating with the chamber empty, and turn on the power switch on the freezer.
2. Turn off the switch of the back-up system (optional component) if it is installed.
3. Check that the battery switch is ON.
4. The audible alarm may activated. In this case, press the buzzer stop key (BUZZER) to silence the alarm.
5. Set the desired chamber temperature. See page 18 for the temperature setting.
6. Check that the chamber temperature reaches the desired temperature.
7. Turn on the switch of back-up system (optional component) if it is installed.
8. Check that the alarm lamp lights and the buzzer sounds by pressing the alarm test key.
9. After confirming the above, you can put articles into the freezer chamber in a small batch to prevent the temperature rise.

Operation after power failure

The set value is memorized by nonvolatile memory. Accordingly, the chamber resumes the operation with setting before power failure. During the power failure, the clock function is operating.

WARNING

When this product operates at the first start-up or after no use for long period, the built-in battery capacity may be lowered or completely zero because of discharge of the battery. After installation the product, the freezer should operate for more than 3 days (72 hours) to charge the battery.

FUNCTION OF CONTROL PANEL

The following functions are available through control panel:.

- 1. Setting of standby operation:** To set a running condition at the start-up. (refer to P.17)
- 2. Setting of log interval and sending to PC:** To set a log interval (page 22) and to send a log date to PC. (refer to P. 24) When this function is used, an optional interface board is necessary. Contact Sanyo sales representative or agent at the time of installation of the optional parts.(refer to P. 53)
- 3. Setting of date and time:** To set the date and time shown on the top screen. (refer to page 29)
- 4. Setting of alarm:** To set the high or low temperature alarm(refer to P. 35). Also, to set the alarm delay (refer to page 16).
- 5. Default setting:** To set the default items including LCD back color. (refer to page 28)
- 6. Alarm test:** The test of alarm buzzer, alarm lamp and remote alarm is effective by pressing the alarm buzzer stop key (BUZZER) for about five seconds during normal operation. Pressing the key again finishes the alarm test.

1. Running operation (Set):

- 1-1 Chamber temperature (Temperature): -80°C (Default setting) (Setting range: -50°C - -90°C) (Refer to page 18)
- 1-2 High temperature alarm (High Alarm): +10°C (Default setting) (Setting range: +5°C - +20°C) (Refer to page 19)
- 1-3 Low temperature alarm (Low Alarm): -10°C (Default setting) (Setting range: -5°C - -20°C) (Refer to page 19)
- 1-4 Alarm delay time (Alarm Delay): 15 min. (Default setting) (Setting range: 0 -15 min.) (Refer to page 20)
- 1-5 Ring back of buzzer (Ring Back): 30 min. (Default setting) (Setting range: 0, 1 – 99 min.) (Refer to page 21)
- 1-6 Key lock (Key Lock): 0 (Default setting), 0: Unlock, 1: Lock (Refer to page 22 – 23)

2. Log (Log): When this function is used, an optional interface board is necessary. Contact Sanyo sales representative or agent at the time of installation of the optional parts.

- 2-1 Log data on past the first (PC 1D) (Refer to page 24)
- 2-2 All of the log data (PC ALL) (Up to 5 weeks) (Refer to page 25)
- 2-3 Clear log data (Clear) (Refer to page 25)

3. Various setting (Tools):

- 3-1 Initialization (Default Setting): When this function from 3-1-2 to 3-1-4 is used, an optional interface board is necessary. Contact Sanyo sales representative or agent at the time of installation of the optional parts.
 - 3-1-1 LCD Back Color: 1 (Default Setting) (1: Blue, 2: White) (Refer to page 28)
 - 3-1-2 DAQ Speed: 0 (Default Setting) (0: 2400, 2: 9600(bit/sec)) (Refer to page 28)
 - 3-1-3 DAQ ID: 0 (Default Setting) (0: OFF, 1 – 250) (Refer to page 28)
 - 3-1-4 DAQ Mode: 0 (Default Setting) (0: Local, 1: Remote) (Refer to page 28)
 - 3-1-5 Remote Alarm: 1 (Default Setting) (0: OFF, 1: Active) (Refer to page 28)
 - 3-1-6 Drive mode (Control: 0 (Default Setting) (0: Normal, 1: ECO) (Refer to page 28)

3-2 Date·Time (Date Time):

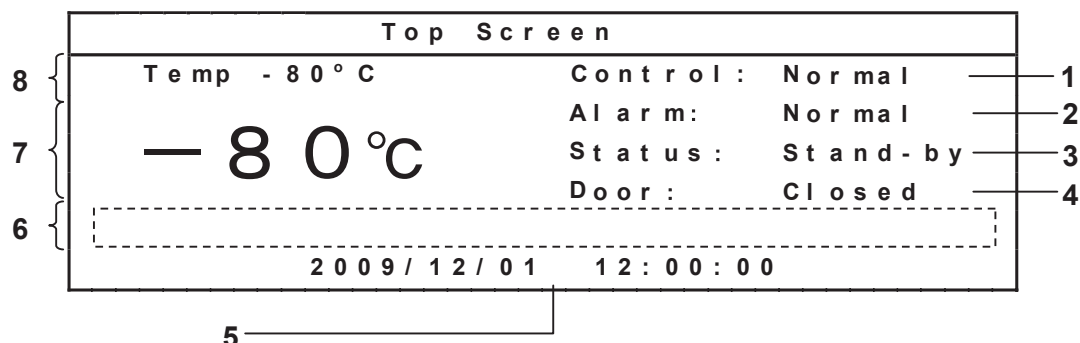
- 3-2-1 Date: (YY/MM/DD) (Refer to page 29)
- 3-2-2 Time: (hh:mm:ss) (Refer to page 29)
- 3-2-3 Door alarm delay time (Door Delay: 2min. (Default Setting) (Setting range: 1 – 15 min) (Refer to page 30)
- 3-2-4 Log Interval: 15 min (Default Setting) (Setting range: 2 – 30 min.) (Refer to page 31)
- 3-2-5 Comp Delay: 3 min. (Default Setting) (Setting range: 3 – 15 min.) (Refer to page 32)

3-3 Key Lock PW Setting: (Refer to page 33)

●After setting, press the menu button (MENU), select “OK” and press the enter key (ENTER) The setting is memorized.

BASIC SCREEN OF CONTROL PANEL

When the power switch is turned on, the top screen is displayed on the LCD panel.



1. Operation indication (Control): "Normal" (initialization value) is indicated by the normal operation. "ECO" is indicated in the saving energy mode. Refer to page 28.

2. Display of alarm (Alarm): "Normal" is usually indicated. "Alarm" or "Warning" is displayed during the alarm status and the additional message is displayed in the message column. "Test" is displayed at the alarm test. For the details of the alarm status, refer to page 25 through page 27.

3. Display of status (Status): "Stand-by" is usually displayed. A status number is displayed and an additional message is displayed in the message column when the operation monitor system detects the specified status. Refer to page 25 for the operation monitor system.

4. Display of door status (Door): "Closed" is displayed when the door is close. "Open" is displayed When the door is open.

5. Display of date and time: The current date and time are displayed.

6. Message column: An additional messages is displayed when the alarm status. Refer to page 33 through page 35 for the details.

7. Display of current value: Current value of chamber temperature is displayed.

8. Display of setting: Set value of chamber temperature is displayed.

RUNNING OPERATION (MENU/Set)

This product is operated with set temperature at the time of start-up.

1. With the basic screen displayed, press the menu button (MENU) to show the menu window. Select "Set", and press the enter key (ENTER).

Top Screen	
Temp - 80 °C	Control : \$
- 80 °C	Alarm : \$
	Status : \$
	Door : (
2009 / 12 / 01 12:00:00	

MENU

Set

Log

Tools

2. A setup screen (Temp. Setting) is displayed. Set up each parameter.

Temp. Setting		
1	Temperature	- 80 °C (- 50 °C - - 90 °C)
2	High Alarm	+ 10 °C (+ 5 °C - + 20 °C)
3	Low Alarm	- 10 °C (- 5 °C - - 20 °C)
4	Alarm Delay	15 min (0 - 15 min)
5	Ring Back	30 min (0. OFF 1 - 99 min)
6	Key Lock	0 (0. Unlock 1. Lock)

1. Temperature : This is a setting of chamber temperature. Temperature settable range is between -50 and -90°C. The factory setting is -80°C.
2. High Alarm: This is a setting of high temperature alarm. Temperature settable range: between chamber temperature +5 and +20°C The factory setting is chamber temperature +10°C.
3. Low Alarm: This is a setting of low temperature alarm. Temperature settable range: between chamber temperature -5 and -20°C The factory setting is chamber temperature -10°C.
4. Alarm Delay: This is a setting of delay time of alarm buzzer for high and low temperature alarm. The settable range is between 0 and 15 minutes. When 0 is set, the alarm buzzer sound without delay. The factory setting is 15 minutes.
5. Ring Back: This is the duration between the stop of alarm buzzer and next start of alarm buzzer. The settable range is between 1 and 99 minutes. The alarm buzzer is not back again when the setting is 0. (OFF). The factory setting is 30 minutes.
6. Key Lock: When 1 (Lock) is selected, the setting cannot be changed. The input of the password is necessary at the time of unlock.

3. Press the menu button (MENU) to finish the settlement of each parameter. Select OK on the menu window, and press the enter key (ENTER). The setting is memorized and the setup screen returns to the top screen.

Temp. Setting	
Temperature	- 80 °C (- 50 °C - - 90 °C)
High Alarm	+ 10 °C (+ 5 °C - + 20 °C)
Low Alarm	- 10 °C (- 5 °C - - 20 °C)
Alarm Delay	15 min (0 - 15 min)
Ring Back	30 min (0. OFF 1 - 99 min)
Key Lock	0 (0. Unlock 1. Lock)

MENU

OK

Cancel

Select Cancel on the menu window, and press the enter key (ENTER). The setting is not memorized and the setup screen returns to the top screen.

Choose OK by this menu window, and push an enter key when you memorize the value of the running operation and the setting. And, when Cancel is chosen, various setting value is not memorized.

RUNNING OPERATION (MENU/Set)

Chamber temperature setting (Temperature)

Table 1 shows the basic procedure for setting the chamber temperature. Perform key operations in the sequence indicated in the table. The example in the table is based on the assumption that the desired temperature is -35°C.

Note: The unit is set at the factory that the chamber temperature -80°C. (Setting range: -50 - -90°C)

Table 1. Basic operation sequence (Chamber temperature -80°C to -75°C)

	Description of operation	Key operated	Indication after operation
1	Switch on the freezer.	----	The basic screen displayed
2	Press the MENU key.	MENU	The menu window is indicated. And the "set" is highlighted.
3	Press the ENTER key.	ENTER	The temp. Setting window indicated. And Chamber temperature -80 is highlighted.
4	The number input key is pressed in order of 7 → 5.	<div>7</div> <div>5</div>	Chamber temperature is changed from -80 to -75.
5	Press the MENU key.	MENU	The menu window is indicated. And the "OK" is highlighted.
6	Press the ENTER key.	ENTER	Chamber temperature is memorized, and the top screen window is indicated.

Note:

The set mode returns to the temperature display mode automatically when 90 seconds has passed without any key operation.

Although the value of the chamber temperature setting can range between -50°C and -90°C, the guaranteed temperature without load is -85°C at ambient temperature of 30°C

RUNNING OPERATION (MENU/Set)

Alarm temp. setting (High Alarm/Low Alarm)

As an example, Table 2 shows the procedure to set the high temperature alarm so that the alarm can activate when the chamber temperature is 5°C higher than the set temperature.

Table 3 shows the procedure to set the low temperature alarm so that the alarm can activate when the chamber temperature is 5°C lower than the set temperature. The buzzer rings with the high temperature alarm and the low temperature alarm after fifteen minutes. (Factory setting)

(The chamber setup temperature $\pm 10^{\circ}\text{C}$ at the time of the factory setting.)

Alarm temperature settable range: between chamber temperature $-/+5$ and $-/+20^{\circ}\text{C}$.

Table 2. Procedure for setting high temperature alarm (Change from $+10^{\circ}\text{C}$ to $+5^{\circ}\text{C}$)

	Description of operation	Key operated	Indication after operation
1		-----	The basic screen displayed
2	Press the MENU key.	MENU	The menu window is indicated. And the "set" is highlighted.
3	Press the ENTER key.	ENTER	The temp. Setting window indicated. And Chamber temperature -80 is highlighted.
4	Select High Alarm item pressing Shift keys.	▼	The set value 10 of the high temperature alarm (High Alarm) is highlighted.
5	The number input key is pressed in order of 0 → 5.	<div>0</div> <div>5</div>	High temperature alarm is changed from +10 to +5.
6	Press the MENU key.	MENU	The menu window is indicated. And the "OK" is highlighted.
7	Press the ENTER key.	ENTER	High temperature alarm is memorized, and the top screen window is indicated.

Table 3. Procedure for setting low temperature alarm (Change from -10°C to -5°C)

	Description of operation	Key operated	Indication after operation
1		-----	The basic screen displayed
2	Press the MENU key.	MENU	The menu window is indicated. And the "set" is highlighted.
3	Press the ENTER key.	ENTER	The temp. Setting window indicated. And Chamber temperature -80 is highlighted.
4	Select Low Alarm item pressing Shift keys.	▼	The set value 10 of the low temperature alarm (Low Alarm) is highlighted.
5	The number input key is pressed in order of 0 → 5.	<div>0</div> <div>5</div>	Low temperature alarm is changed from -10 to -5.
6	Press the MENU key.	MENU	The menu window is indicated. And the "OK" is highlighted.
7	Press the ENTER key.	ENTER	Low temperature alarm is memorized, and the top screen window is indicated.

Note:

The high temperature alarm / low temperature alarm set mode returns to the temperature display mode automatically when 90 seconds has passed without any key operation. And, high temperature alarm / low temperature alarm setting value is not memorized.

RUNNING OPERATION (MENU/Set)

Alarm delay time setting (Alarm Delay)

The setting range for delay time is between 0 and 15 minutes. When 0 is set, the alarm buzzer sound without delay. The factory setting is 15 minutes. Table 4 shows the basic procedure for setting the alarm delay time. (Example: Alarm delay time is changed from 15 minutes to 10 minutes.)

Table 4. Procedure for setting alarm delay time (Change from 15 minutes to 10 minutes)

	Description of operation	Key operated	Indication after operation
1		-----	The top screen displayed
2	Press the MENU key.	MENU	The menu window is indicated. And the "set" is highlighted.
3	Press the ENTER key.	ENTER	The temp. setting window indicated. And current chamber temperature is highlighted.
4	Select Alarm Delay item pressing Shift keys.	▼	The set value 15 of the alarm delay time (Alarm Delay) is highlighted.
5	The number input key is pressed in order of 1 → 0.	<div>1</div> <div>0</div>	Alarm delay time (ALARM Delay) is changed from 15 to 10.
6	Press the MENU key.	MENU	The menu window is indicated. And the "OK" is highlighted.
7	Press the ENTER key.	ENTER	Alarm delay time is memorized, and the top screen window is indicated.

Note:

The high temperature alarm / low temperature alarm set mode returns to the temperature display mode automatically when 90 seconds has passed without any key operation. And, high temperature alarm / low temperature alarm setting value is not memorized.

RUNNING OPERATION (MENU/Set)

Ring back of alarm buzzer setting (Ring Back)

The alarm buzzer is silenced by pressing alarm buzzer stop key (BUZZER) on the control panel during alarm condition (The remote alarm sound and lamp are not silenced.). The buzzer will be activated again after certain suspension if the alarm condition is continued.

The suspension time can be set by following the procedure shown in the Table 5 below. (The duration is set in 30 minutes at the factory.)

Table 5 Setting procedure for alarm ring back time (Change from 30 minutes to 10 minutes)

Table 6 Setting procedure for alarm ring back time (change from 30 minutes to 10 minutes)			
	Description of operation	Key operated	Indication after operation
1		-----	The top screen displayed
2	Press the MENU key.	MENU	The menu window is indicated. And the “set” is highlighted.
3	Press the ENTER key.	ENTER	The temp. setting window indicated. And current chamber temperature is highlighted.
4	Select Ring Back item pressing Shift keys.	▼	The set value 30 of the ring back time (Ring Back) is highlighted.
5	The number input key is pressed in order of 1 → 0.	<div>1</div> <div>0</div>	Ring back time (Ring Back) is changed from 30 to 10.
6	Press the MENU key.	MENU	The menu window is indicated. And the “OK” is highlighted.
7	Press the ENTER key.	ENTER	Ring back time is memorized, and the top screen window is indicated.

Note:

- The settable alarm resume time is 1 to 99 minutes. The buzzer would not reset if the reset time is set in 000.
- It is recommended to set the alarm resume time when the freezer is not under alarm condition. The new setting is effective on the next alarm condition. The setting cannot be changed during power failure.
- The remote alarm during power failure or buzzer and remote alarm during alarm test cannot be silenced.
- The setting mode returns to the temperature display mode automatically when 90 seconds has passed without any key operation. And, ring back setting value is not memorized.

RUNNING OPERATION (MENU/Set)

Key lock function

This unit is provided with the key lock function. When the key lock is ON, change of temperature setting through the key pad is not available. The key lock is set in OFF at the factory.

If a key lock is on, a temperature selection screen can be seen. But, numerical value cannot be changed. Setup procedure is the following.

Table 6. Procedure for key lock setting (Change from Unlock to Lock)

	Description of operation	Key operated	Indication after operation
1		-----	The top screen displayed
2	Press the MENU key.	MENU	The menu window is indicated. And the "set" is highlighted.
3	Press the ENTER key.	ENTER	The temp. setting window indicated. And current chamber temperature is highlighted.
4	Select Ring Back item pressing Shift keys.	▼	The set value 0 of the key lock (Key Lock) is highlighted.
5	The number input key is pressed in order to 1.	<div>1</div>	Key lock (Key Lock) is changed from 0 to 1.
6	Press the MENU key.	MENU	The menu window is indicated. And the "OK" is highlighted.
7	Press the ENTER key.	ENTER	Ring back time is memorized, and the top screen window is indicated.

RUNNING OPERATION (MENU/Set)

Key lock release function

Table 7. Procedure for key unlock setting (Change from Lock to Unlock) (The duration is set in 0000 at the factory.)

	Description of operation	Key operated	Indication after operation
1		-----	The top screen displayed
2	Press the MENU key.	MENU	The menu window is indicated. And the "set" is highlighted.
3	Press the ENTER key.	ENTER	The temp. setting window indicated. And current chamber temperature is highlighted.
4	Select Ring Back item pressing Shift keys.	▼	The set value 1 of the key lock (Key Lock) is highlighted.
5	The number input key is pressed in order to 0. And press the ENTER key.	0 ENTER	Key lock (Key Lock) is changed from 1 to 0. And Password is indicated on the right of the numerical value. (Refer to the following.)
6	The number input key is pressed in order to 0000. And press the ENTER key.	0 0 0 0 ENTER	"*****" is indicated in the password input column (Password). (An input password is not indicated with a number.)
7	Press the MENU key.	MENU	The menu window is indicated. And the "OK" is highlighted.
8	Press the ENTER key.	ENTER	A key lock is canceled, and a Top Screen window is indicated.

The following screen is indicated when input of a password (Password) during the key lock (Key Lock) release operation requires it. (The process 5 of the table 7)

Temp. Setting	Key Lock	
Temperature -	80 °C	(- 50 °C - - 90 °C)
High Alarm	+10 °C	(+ 5 °C - + 20 °C)
Low Alarm	- 10 °C	(- 5 °C - - 20 °C)
Alarm Delay	15 mi n	(0 - 15 mi n)
Ring Back	30 mi n	(0 . OFF 1 - 99 mi n)
Key Lock	0	Password ■■■■

1. Password (Password) input column : When 0 is input, this screen is indicated for a key lock (Key Lock) release. Input the password set up in "the password (Password) input column" with a number input key.

Note :

The buzzer sounds if a password is wrong. Again, input a password. A user should manage a password with all of the members. Factory setting is 0000. Refer to P.32.

Contact Sanyo sales representative or agent at the time when a password is forgotten.

VARIOUS SETTING (MENU/Log)

Display of log (Log)

This product has the function to record chamber temperature. (Initialization value is for about 5 weeks by the record interval for fifteen minutes.) This record is seen by the log indication (Log) of the display, or data can be transmitted to the personal computer. A setup example is shown in the following.

Table 8 : Display indication and the process to transmit past 1-day chamber temperature record value

		Description of operation	Key operated	Indication after operation
The indication of the log data	1		----	The top screen displayed
	2	Press the MENU key.	MENU	The menu window is indicated. And the "set" is highlighted.
	3	Press the ENTER key.	▼ ENTER	The record value of 1-day of chamber temperature is indicated by the graph in the display.
	4	The shift key is pressed, and the graph of a date to transmit to the PC is indicated.	◀ ▶	The date of the graph changes, and a graph indicates log data on the kept past in every 1-day.
The transmission of the log data	5	Press the MENU key.	MENU	A menu window is indicated, and the log of 1-day (PC 1D) is highlighted. (The following reference.)
	6	When it is highlighted, the log of 1-day presses an enter key in the menu window.	ENTER	The screen (Progress) which transmits log data on chamber temperature of 1-day doing a record to the personal computer is indicated.
	7	Highlight indicates the start (Start) of the menu window, and press the ENTER key.	ENTER	Transmission is started in the personal computer of the log data on chamber temperature of 1-day being recorded. "Sending..." and the number of transmit data are indicated in the display at the time of the transmission.
	8			A completion message (Finished.) is indicated.
The end of the log data display	9	If a completion message is indicated, press the MENU key.	MENU	The menu window is indicated. And the "Start" is highlighted.
	10	A shift key is pressed, and Cancel of the menu window is chosen, and press the ENTER key.	▼ ENTER	Log data on 1-day of chamber temperature are indicated by the graph in the display.
	11	Press the MENU key.	MENU	The record (PC 1D) of 1-day of the menu window is highlighted.
	12	The shift key is pressed, and made to highlight Cancel of the menu window, and press the ENTER key.	▼ ENTER	The basic screen (Top screen) top screen displayed

Note: When this function is used, an optional interface board is necessary. Contact Sanyo sales representative or agent at the time of installation of the optional parts.



1. The indication of the date of the log screen : The log date of the chamber temperature data is indicated. When a log data screen is indicated and the left-right key of the shift key is pressed, the date of 1. changes, and the chamber temperature log of that date is indicated. Indicate the log screen of a date to transmit when data on 1-day are transmitted to the PC, and start transmission.

2. Temperature indication range : When the left-right key of the shift key is pressed, indication temperature changes from -25°C --100°C to 50°C --25°C.

VARIOUS SETTING (MENU/Log)

Indication of the log and transmission

Table 9 : Display indication and the process to transmit past all date chamber temperature record value

		Description of operation	Key operated	Indication after operation
The indication of the log data	1		-----	The top screen displayed
	2	Press the MENU key.	MENU	The menu window is indicated. And the "set" is highlighted.
	3	Press the ENTER key.	▼ ENTER	The record value of 1-day of chamber temperature is indicated by the graph in the display.
The transmission of the log data	4	The shift key is pressed, and the graph of a date to transmit to the PC is indicated.	▼	A menu window is indicated, and the log of PC All (PC All) is highlighted.
	6	The shift key is pressed, and the graph of the all date to transmit to the PC is indicated.	ENTER	The screen (Progress) which transmits log data on chamber temperature of all date doing a record to the personal computer is indicated.
	7	Highlight indicates the start (Start) of the menu window, and press the ENTER key.	ENTER	Log data on all date (About five weeks is a Max.) of chamber temperature are indicated by the graph in the display.
	8			A completion message (Finished.) is indicated.
The end of the log data display	9	If a completion message is indicated, press the MENU key.	MENU	The menu window is indicated. And the "Start" is highlighted.
	10	A shift key is pressed, and Cancel of the menu window is chosen, and press the ENTER key.	▼ ENTER	Log data on 1-day of chamber temperature are indicated by the graph in the display.
	11	Press the MENU key.	MENU	The record (PC 1D) of 1-day of the menu window is highlighted.
	12	The shift key is pressed, and made to highlight Cancel of the menu window, and press the ENTER key.	▼ ENTER	The basic screen (Top screen) top screen displayed

Note: When this function is used, an optional interface board is necessary. Contact Sanyo sales representative or agent at the time of installation of the optional parts.

Settlement of each parameter:

With the shift key ◀, ▶, the date is shifted. (◀; past date, ▶; new date)

- The settable range is between 2 and 30 minutes. The factory setting is 15 minutes. With 15 minutes log interval, the recording for about 5 weeks is available.
- For the indication resolution of the display screen : About 1°C / dot and about 10 minutes/dot
- When all saved chamber temperature log value is erased, a menu key is pressed, and the log (Log) of the menu window is chosen, and a screen is indicated when the clear (Clear) of the menu window is chosen. All log data are erased when "OK" is chosen by the menu window.
- If log data are full, it is erased automatically in order from the old data.

VARIOUS SETTING (MENU/Log)

The operation of the hyper-terminal on the PC side (In case of Windows 2000 and XP)

When this function is used, an optional interface board is necessary. Contact Sanyo sales representative or agent at the time of installation of the optional parts.

1. Start a program-accessories-communication-hyper-terminal from the starting button. The registration of the starting menu is to start in the following method, C : Start from ¥Program Files¥ Windows NT¥hypertrm.exe.

2. Set up the following through the hyper-terminal screen.

- New connection Name (Example) Sanyo

- Setup of the connection Connection port COM1

- Properties of COM1 Setup of the port

- Bit/sec.: 9600 Data bit: 8 Parity: No Stop bit: 1 Flow control: Xon/Xoff

(When a log transmitting screen is opened, terms of communication on the MDF side are set on the above condition automatically.)

3. Data transmitting screen is displayed. Specify a transfer, a capture of the textbook and a preservation file name by the operation on the PC side hyper-terminal. Specify the extension of the preservation file name with txt or csv.

4. Operation on the product side presses a menu key (MENU) according to process of P24 more than a Log screen. Then, it is made to indicate a menu window. Then, choose Start, and press an enter key (ENTER). Transmission is started.

5. The transmission is finished, with "Finished" indication.

VARIOUS SETTING (MENU/Tools)

Initialization (Tools/Default Setting)

1. Choose initialization (Default Setting) with a shift key in the basic screen (Select Tools). An initialization screen is indicated when a menu key (MENU) is pressed and made to indicate a menu window and OK is chosen and an enter key (ENTER) is pressed. Each parameter is set up under this condition. (Each parameter is the condition of the initial value on this screen.)

	Default Setting		
1	LCD Back Color	1	(1. Blue 2. White)
2	DAQ Speed	0	(0. 2400 2. 9600)
3	DAQ ID	0	(0. OFF 1 - 250)
4	DAQ Mode	0	(0. Local 1. Remote)
5	Remote Alarm	1	(0. OFF 1. Active)
6	Control	0	(0. Normal 1. ECO)

2. After setting, press the menu button (MENU), select "OK" and press the enter key (ENTER). The setting is memorized.

Note: When the interface board of the option is installed on the product, "the function of 2 to 4 of each following parameter setting range is used. Contact Sanyo sales representative or agent at the time of installation of the optional parts.

Each parameter setting range:

1. LCD Back Color : Setup of the back light (1. Blue 2. White) (The duration is set in 1. Blue at the factory.)

2. DAQ Speed: The interface board of the option is attached, and it is the communication speed when it is connected with the DAQ system and so on. It can be set up in 0. 2400bps, 1. 4800bps and 2. 9600bps. Though a display screen is the indication of 0 and 2, it is possible that it is set up in 1, too. Usually, 0. Use with 2400. It is the DAQ standard command mode. (The duration is set in 0. 2400bps at the factory.)

3. DAQ ID: Select any ID between 1 and 250 when an optional interface board is attached. At this time, never overlap. (The duration is set in 0. at the factory.)

4. DAQ Mode: The setting of change from PC side is impossible when 0 "Local" is selected. The temperature change on "Temp. Setting" screen is impossible and "Remote" is displayed on the upper right of "Temp. Setting" screen when 1 "Remote" is selected. The DAQ mode is effective when DAQ speed is 0 "2400" or 2 "9600" When 1 is chosen, "Remote" is highlighted at the upper right of the Temp. Setting screen.

5. Remote Alarm: ON-off of the remote alarm contact can be set up at the time of the alarm. (The duration is set in 1. at the factory.)

6. Control: 0. Normal (Normal) is the mode of the normal operation. (The duration is set in 0. at the factory.) 1. Eco-mode (ECO) is the mode which it drives in with saving energy without using the operation of the compressor as much as possible. A state of operation is indicated in the column of Control of the Temp. Setting screen. When it is compared with the normal mode, about 5% is effective in the eco-mode (ECO) in the year on saving energy.

Note: The period of temperature of the chamber may become irregular in case of the eco-mode (ECO). The normal mode (Normal) is recommended when a temperature recorder is installed on this product.

VARIOUS SETTING (MENU/Tools)

Set of date, time, log interval (Tools/Date Time)

A date, time and a Log interval configuration screen (Date Time) are chosen on the basic screen (Select Tools). Then, each parameter is set up on the date, time setup screen (Date Time).

	Date	Time	
1	Date	09 / 12 / 01	(YY / MM / DD)
2	Time	12 : 00 : 00	(hh : mm : ss)
3	Door Delay	2 mi n	(1 - 15 mi n)
4	Log Interval	15 mi n	(2 - 30 mi n)
5	Comp Delay	3 mi n	(3 - 15 mi n)

Each parameter setting range:

- 1. Date:** Present date is indicated. (Example : in case of December 1, 2009) (Refer to a table 10.)
- 2. Time:** Present time is indicated. (Example : in case of 12:00:00) (Refer to a table 10.)
- 3. Door Delay:** The variable range of the door alarm delay is 1 to 15 minutes. (Factory setting is 2 minutes.) (Page 30 Refer to a table 11)
- 4. Log Interval:** Settable between 2 minutes and 30 minutes. (Factory setting is 15 minutes.) With 15 minutes interval, recording for about 5 weeks is available.
- 5. Comp Delay:** Delay time for high temperature side/low temperature side compressor after power failure. The settable range is between 2 minutes until 30 minutes. (Factory setting is 3 minutes.)

Table 10 Setting of date and time (When time is set up at 12:00:00 on December 1, 2009)

	Description of operation	Key operated	Indication after operation
1		----	The top screen displayed
2	Press the MENU key.	MENU	The menu window is indicated. And the "set" is highlighted.
3	Press the ENTER key.	▼ ENTER	The temp. setting window indicated.
4	Select Date Time item pressing Shift keys.	▼	A menu window is indicated, and the log of Date Time is highlighted.
5	Select Ring Back item pressing MENU key. Then, pressing ENTER key	MENU ENTER	The Date Time setting window indicated.
6	The number input key is pressed in order of 0 → 9 → 1 → 2 → 0 → 1.	0 9 1 2 0 1	The numerical value of the date is changed to 09/12/01.
7	Select Time item pressing Shift keys.	▼	Time (Time) highlights.
8	The number input key is pressed in order of 1 → 2 → 0 → 0 → 0 → 0.	1 2 0 0 0 0	The numerical value of the time (Time) is changed at 12: 00:00.
9	Press the MENU key.	MENU	The menu window is indicated. And the "OK" is highlighted.
10	Press the ENTER key.	ENTER	Date time is memorized, and the top screen window is indicated.

VARIOUS SETTING (MENU/Tools)

Set of door alarm delay time (Tools/Door Delay)

This product has the setup function of the door alarm delay time. (Factory setting is 2 minutes.) The variable range of the door alarm delay time is 1-minute-15 minutes. . A setup example is the following.

Table 11 Door alarm delay time setup process (When door alarm delay time is changed from 2 minutes to 10 minutes.)

	Description of operation	Key operated	Indication after operation
1		-----	The top screen displayed
2	Press the MENU key.	MENU	The menu window is indicated. And the "set" is highlighted.
3	Press the ENTER key.	▼ ENTER	The temp. setting window indicated.
4	Select Date Time item pressing Shift keys.	▼	A menu window is indicated, and the log of Date Time is highlighted.
5	Select Ring Back item pressing MENU key. Then, pressing ENTER key	MENU ENTER	The Date Time setting window indicated.
6	Select Door Delay item pressing Shift keys.	▼	Door Delay highlights.
7	The number input key is pressed in order of 1→0.	1 0	The numerical value of the Log Interval (Log Interval) is changed at 15 to 10.
8	Press the MENU key.	MENU	The menu window is indicated. And the "OK" is highlighted.
9	Press the ENTER key.	ENTER	Date time is memorized, and the top screen window is indicated.

VARIOUS SETTING (MENU/Tools)

Set of log interval (Tools/Log Interval)

This product can change the set point of the log interval (Log Interval) until 2 minute - 30 minutes. (Factory setting is 15 minutes.) It can be recorded for about 5 weeks if it is a log interval for 15 minutes.

Table 12 The log interval set-up steps of the log (When a log interval is changed from 15 minutes to 10 minutes.)









	Description of operation	Key operated	Indication after operation
1		-----	The top screen displayed
2	Press the MENU key.	MENU	The menu window is indicated. And the "set" is highlighted.
3	Press the ENTER key.	▼ ENTER	The temp. setting window indicated.
4	Select Date Time item pressing Shift keys.	▼	A menu window is indicated, and the log of Date Time is highlighted.
5	Select Ring Back item pressing MENU key. Then, pressing ENTER key	MENU ENTER	The Date Time setting window indicated.
6	Select Door Delay item pressing Shift keys.	▼	Log Interval highlights.
7	The number input key is pressed in order of 1→0.	1 0	The numerical value of the Log Interval (Log Interval) is changed at 15 to 10.
8	Press the MENU key.	MENU	The menu window is indicated. And the "OK" is highlighted.
9	Press the ENTER key.	ENTER	Date time is memorized, and the top screen window is indicated.

VARIOUS SETTING (MENU/Tools)

Change of compressor delay time (Tools/Comp. Delay)

There is a starting delay time setup (Comp Delay) of A compressor /B compressor in the power failure recovery in this product. That can be set up until 3-15 minutes. A compressor setup in the factory shipment is 3 minutes. An A compressor starts first. (it is seen from the rear, the left) A compressor starts B compressor, and starts after about one minute.

Table 13 Compressor starting delay time setup process (When the starting delay time of the compressor is changed from 3 minutes to 5 minutes.)

	Description of operation	Key operated	Indication after operation
1		-----	The top screen displayed
2	Press the MENU key.	MENU	The menu window is indicated. And the "set" is highlighted.
3	Press the ENTER key.	 	The temp. setting window indicated.
4	Select Date Time item pressing Shift keys.		A menu window is indicated, and the log of Date Time is highlighted.
5	Select Ring Back item pressing MENU key. Then, pressing ENTER key	 	The Date Time setting window indicated.
6	Select Comp Delay item pressing Shift keys.		Comp Delay highlights.
7	The number input key is pressed in order of 0→5.	 	The numerical value of the Comp Delay (Comp Delay is changed at 3 to 5).
8	Press the MENU key.	MENU	The menu window is indicated. And the "OK" is highlighted.
9	Press the ENTER key.	ENTER	Date time is memorized, and the top screen window is indicated.

VARIOUS SETTING (MENU/Tools)

Set of key lock password (Tools/Key Lock PW Setting)

1. On the setting screen (Select Tools), select “Key Lock PW Setting”, select “OK” and press the enter key (ENTER). Input the present password (4 digits), select “OK” and press the enter key (ENTER). (Factory setting is 0000.)

Key Lock PW Setting	
Current User Password	0000

2. Input a new password, select “OK” and press the enter key (ENTER).

Key Lock PW Setting	
New User Password	0000

3. Input the password again, select “OK” and press the enter key (ENTER).

Key Lock PW Setting	
New User Password	****
Re Enter User Password	0000

ALARM BUZZER

- Temperature alarm buzzer (intermittent tone)

It is informed with the intermittent tone of the buzzer when a high temperature alarm (High Alarm) or a low temperature alarm (Low Alarm) occur.

Buzzer informs it with the intermittent sound when an alarm condition goes on for more than alarm the time when it was set up with Delay. Push alarm buzzer stop key (BUZZER) to stop the alarm. The alarm buzzer sounds again if an alarm is not solved in the time when it is set up with Ring Back. When alarm sounds, a remote alarm is activated, too.

- Door alarm buzzer (intermittent tone)

It is informed with the intermittent tone if it is the condition that the door opens beyond the time when it is set up with Door Delay. It stops if a door is closed.

- Filter alarm buzzer (intermittent tone)

It is informed with the intermittent tone when the temperature of filter sensor is beyond +48.0°C
Buzzer sound stops when the temperature of the filter sensor is less than +43.0°C

*: Buzzer stops if the alarm buzzer stop key (BUZZER) is pushed when an alarm occurs and a buzzer sounds.

MONITOR OF FREEZER STATUS

This product has the operation monitor system which shows it in the table 14. It is the system to inform it of the operation conditions of the product. Operation conditions are indicated in the Status indication of the basic screen and the message indication.

Table 14 Operation monitor system (STATUS) list

Kind of function	Status	Indication	If this status continues	Remedy
Notice of abnormal ambient temperature	When the ambient temp. is over approx. 35°C or lower than about 0°C.	STATUS indication : "Status_1" is indicated. Message indication : "Ambient temp is abnormal" is indicated.	Decrease of cooling performance or durability of refrigerating circuit.	Recheck air-conditioning of installed site.
Notice of low voltage	When the power source voltage is less than approx. 195 V when the rated voltage is between 220 and 240 V.	STATUS indication : "Status_2" is indicated. Message indication : "The power-supply is abnormal" is indicated.	Abnormal heat at power supply outlet or degrade of starting performance of refrigerating circuit	Use dedicated power source.
The notice of the overload operation	When it did not reach setup temperature for more than 5 days.	STATUS indication : "Status_3" is indicated. Message indication : "Cooling circuits Overload" is indicated.	A problem occurs in the cooling performance and the durability of the cooling circuit.	(1) Large quantities of things are not put in the chamber in a short time. (2) It is checked whether a door is not opened for a long time or there is no packing defect of the outer door and the inner door. (3) Setup temperature is used by more than -80°C. *: Status indication and message indication disappear when a problem cleared it in the above and reached setup temperature.

Note :

- Buzzer operation and a remote alarm can not be done with the monitor of the freezer status.
- STATUS indicates only "STATUS_1" when two problems occur in the monitor of the freezer status. STATUS indicated is to cope with it.

ALARMS & SAFETY FUNCTIONS

This product has the alarm & safety function of the table 15.

Table 15 Alarm & safety function list

Alarm & safety	Situation	Indication	Buzzer	Safety operation
High temp. alarm	If the chamber temperature is higher than the temperature at which the high temperature alarm is activated.	Alarm lamp flashed Temp. indicator is flashed Message indication: "High Temp Warning 20XX/XX/XX XX:XX:XX"	After the time when it is set with alarm delay intermittent sound	Remote alarm it operates after the time when it is set with alarm delay
Low temp. alarm	If the chamber temperature is lower than the temperature at which the low temperature alarm is activated.	Alarm lamp flashed Temp. indicator is flashed Message indication: "Low Temp Warning 20XX/XX/XX XX:XX:XX"		
Power failure alarm	When the power to the unit is disconnected.	Alarm lamp flashed Message indication: Power failure Warning 20XX/XX/XX XX:XX:XX"	Intermittent tone	Remote alarm
Door alarm	When door is open.	Door check lamp lights	After the time when it is set with alarm delay intermittent sound	-----
Operation memory	Record of chamber condition during the power failure. The memory of the set point before the power failure.	-----	-----	The set value is memorized by nonvolatile memory. The freezer resumes the operation with setting before power failure.
Key lock	When the key lock is on.	-----	-----	Setup cannot be changed.
Auto-return	When there is no key pressing in each setting mode for 90 seconds.	Chamber temperature is displayed.	-----	Finishing of each setting mode.
Battery check	When about 3 years has passed with power switch ON.	Message indication: "Please exchange batteries."	-----	-----
Fan motor check	When a power switch was turned on and it passed for about 6 years.	Message indication: "Please exchange a fan motor."	-----	-----

Note : A message and an alarm date indicate it in the indication of the high temperature alarm/low temperature alarm/blackout alarm. And, message indication is indicated until an alarm buzzer stop key (BUZZER) is pushed.

ALARMS & SAFETY FUNCTIONS

Table 15. Alarms and safety functions

Alarm & safety	Situation	Indication	Buzzer	Safety operation
Sensor abnormality	If the thermal sensor is disconnected.	Message indication: "Error E01: Temp Sensor Open."	Intermittent tone	Remote alarm. Unit is continuous running.
	If the thermal sensor is short-circuited.	Message indication: "Error E02: Temp Sensor Short."		
	If the condenser sensor is disconnected.	Message indication: "Error E03: Condenser Sensor "A" Open."	Intermittent tone	Remote alarm.
	If the condenser sensor is short circuited.	Message indication: "Error E04: Condenser Sensor "A" Short."		
	If the condenser sensor is disconnected.	Message indication: "Error E05: Condenser Sensor "B" Open."	Intermittent tone	Remote alarm.
	If the condenser sensor is short-circuited.	Message indication: "Error E06: Condenser Sensor "B" Short."		
	If the ambient temperature sensor is disconnected.	Message indication: "Error E07: Ambient Temp. Sensor Open."	Intermittent tone	Remote alarm.
	If the ambient temperature sensor is short-circuited.	Message indication: "Error E08: Ambient Temp. Sensor Short."		
Battery switch check	When the battery switch is OFF during alarm test.	Message indication: "Error E09: Battery switch is off."	-----	-----
Condenser temp. abnormality	In the event of failure of fan motor for cooling the compressor.	Message indication: "Error E10: Condenser Temp. is abnormal."	Intermittent tone	Remote alarm. All compressor are stops.
Fan motor abnormality	If the fan motor "A" is stopped.	Message indication: "Error E16: Fan motor "A" abnormal."	Intermittent tone	Remote alarm. Fan motor "B" is continuous running.
	If the fan motor "B" is stopped.	Message indication: "Error E17: Fan motor "B" abnormal."	Intermittent tone	Remote alarm. Fan motor "A" is continuous running.
Cooling circuit abnormality	If the cooling circuit "A" broke down.	Message indication: "Error E18: Cooling circuit "A" abnormal."	Intermittent tone	Remote alarm.
	If the cooling circuit "B" broke down.	Message indication: "Error E19: Cooling circuit "B" abnormal."	Intermittent tone	Remote alarm.

Note:

- When the operation is started in high ambient temperature, the alarm lamp (ALARM) sometimes flashes, and then the message (Please check a condenser filter) of the filter alarm is indicated on it in the basic screen. In this case, the lamp is off automatically when the chamber temperature is getting lower.
- The freezer resumes the operation after power failure with the temperature setting before power failure as the chamber temperature setting and alarm temperature setting are memorized in the nonvolatile memory.
- The chamber temperature is displayed for 5 seconds by pressing buzzer stop key (BUZZER) during power failure alarm. Then the buzzer is silenced. The alarm lamp keeps flashing.

ROUTINE MAINTENANCE

WARNING

Always disconnect the power supply to the unit prior to any repair or maintenance of the unit in order to prevent electric shock or injury.

Ensure you do not inhale or consume medication or aerosols from around the unit at the time of maintenance. These may be harmful to your health.

Cleaning of cabinet

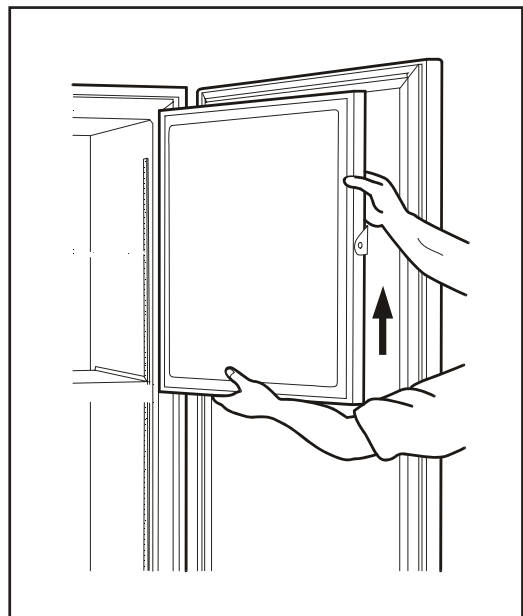
- Clean the unit once a month. Regular cleaning keeps the unit looking new.
- Use a dry cloth to wipe off small amounts of dirt on the outside and inside of the unit and all accessories. If the outside panels are dirty, clean them with a diluted neutral dishwashing detergent. (Undiluted detergent can damage the plastic components. For the dilution, refer to the instruction of the detergent.) After the cleaning with the diluted detergent, always wipe it off with a wet cloth. Then wipe off the cabinet or accessories with a dry cloth.
- Never pour water onto or into the unit. Doing so can damage the electric insulation and cause failure.
- The compressor and other mechanical parts are completely sealed. This unit requires absolutely no lubrication.
- Check the back-up system by pressing test switch once a month if it is installed.
- Remove the frost or ice on the chamber wall and clean the condenser filter once a month.

Defrosting of inside wall

The frost is built at the upper portion of the chamber and inner door. The excessive frost possibly make some gap between the cabinet and door gasket, which may cause poor cooling. Remove the frost on the inner door with a scraper enclosed with the unit. Following shows the procedure for removing the chamber frost.

Note: For removing the frost, do not use a tool with sharp edge such as a knife or a screw driver.

1. Turn off the back-up system if applicable.
2. Take out and transfer all the contents to another freezer or a container which is refrigerated by liquid carbon dioxide or dry ice.
3. Turn off the power switch of the freezer.
4. Open the outer door and inner door. Remove the inner door by lifting up as shown in the figure.
5. Leave the freezer as it is.
6. The water accumulated on the bottom of the chamber should be wiped up with a dry cloth.
7. After cleaning the chamber and inner door, replace the inner door and start up the unit according to the procedure on page 14.
8. Put back the articles into the sufficiently cooled freezer compartment.
9. Turn on the back-up system if it is provided.



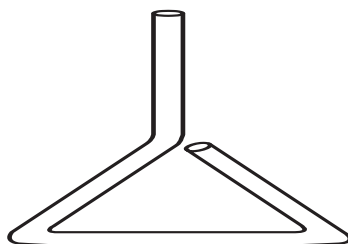
NOTE: Condenser coils is a "Flow-Thru" type, so this unit has no air filter to be cleaned.

ROUTINE MAINTENANCE

Cleaning of air intake port

The cap of the left side is turned counterclockwise (Counterclockwise direction), and this product is removed, and the outer air is adopted into the chamber, and it opens a outer door. Therefore, frost is easy to be settled around the air intake port inside the chamber. Clean it in the case shown below.

Condition	Check / Remedy
When frost and ice can be seen in the port of the air intake port.	The pipe of the air intake port is thrust with a stick for air intake port cleaning of the accessories, and frost is taken.
An outside door does not open even if the cap of the air intake port is opened.	The pipe of the air intake port is thrust with a stick for air intake port cleaning of the accessories, and frost is taken.
Frost and ice can be seen in the chamber.	Frost inside the chamber and ice are taken with Hera of the accessories.



Stick for air intake port cleaning (Accessory)



WARNING

For removing the frost of the release port, do not use a tool with sharp edge such as a knife or a screw driver.

REPLACEMENT OF BATTERY

Location of a nickel-metal-hydride battery

This unit is provided a nickel-metal-hydride battery for the power failure warning device. The battery is located in the electrical box inside the cover on the lower left side. (Fig. 1)



The high voltage components are enclosed in the electrical box. The cover should be removed by a qualified engineer or a service personnel only to prevent the electric shock..

Removal of nickel-metal-hydride battery

1. Turn off the power switch and disconnect the power supply plug.
2. As shown in the Fig. 2, remove 4 screws fixing the side cover with a screw driver and remove the side cover..
3. Remove 4 screws fixing the electrical box cover with a screw driver. (Fig. 3)
4. Disconnect the battery connector and remove 2 screws fixing the battery mounting plate. (Fig. 4)
5. Take out the battery.
6. Follow the procedure for recycling or proper disposal.y to prevent the electric shock.

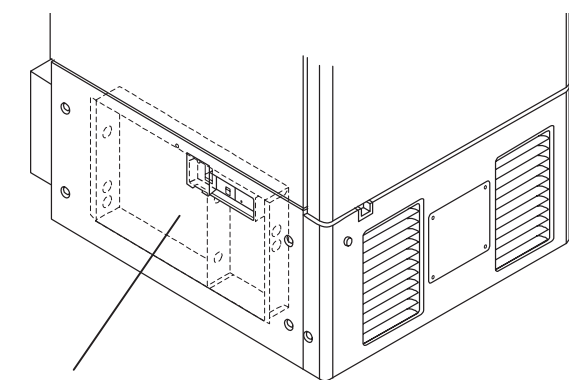


Fig. 1

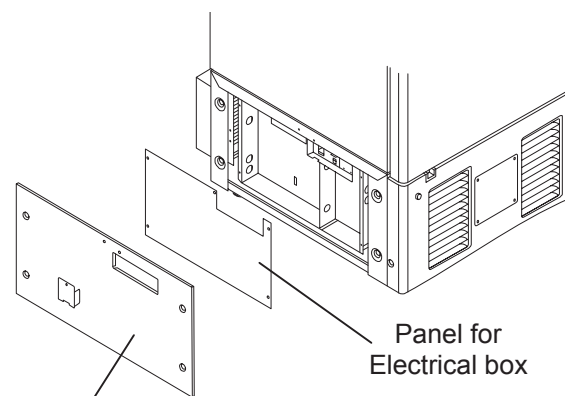


Fig. 2

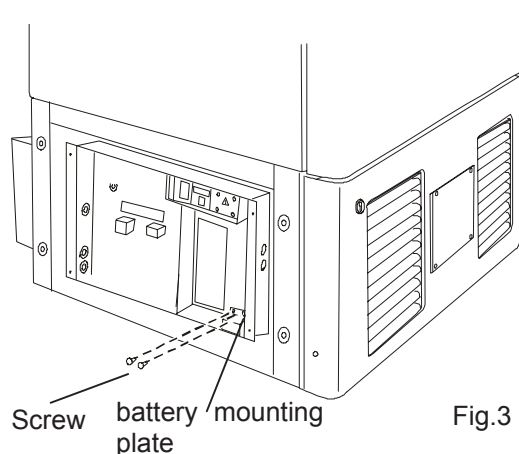


Fig.3

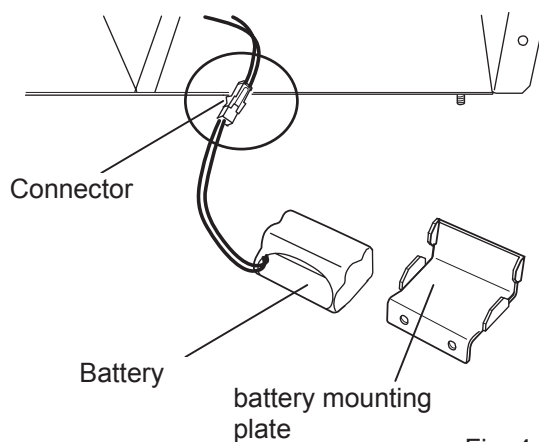


Fig. 4

TROUBLESHOOTING

If the unit malfunctions, check out the following before calling for service.

Malfunction	Check/Remedy
If nothing operates even when switched on	<ul style="list-style-type: none"> ▪ The unit is not connected to the power supply. ▪ There is a power failure. ▪ The fuse is blown or the circuit breaker is activated.
An alarm system works	<ul style="list-style-type: none"> ▪ Investigate the following cause when an alarm display lamp and buzzer sound are working. ▪ When use starts. <p>Is temperature of the freezer chamber the value?</p> <ul style="list-style-type: none"> ▪ When it is using. <p>Were not you taking the condition that opened the change of the temperature command and a door for a long time?</p> <p>Did not you put the sample whose temperature was high in the freezer chamber?</p> <p>An alarm is canceled naturally when it is left in these cases.</p>
The cooling is poor	<ul style="list-style-type: none"> ▪ The environmental temperature is too high. ▪ The door is not shut tightly. ▪ The inner lid is not installed correctly. ▪ The set temperature in the controller is not set properly. ▪ The grille is blocked out. ▪ The filter is clogged. <p>(Clean a filter if an alarm display lamp has a flash and "Please check a condenser filter." is indicated by you on the basic screen.)</p> <ul style="list-style-type: none"> ▪ The freezer is in the direct sunlight. ▪ There is any heating source near the freezer. ▪ A rubber cap and insulation for the access port are not set correctly. ▪ You put too many unfrozen articles into the freezer compartment.
Dew condensation is settled in the appearance of the freezer.	<ul style="list-style-type: none"> ▪ When a stifling day lasts, or it sometimes dews in the exterior of the freezer by the installation features. When humidity is high, it touches the thing that water in the air is cold, and this is to the benefit that dew condensation is settled, and it is not a trouble. Take a butterbur with the cloth which dried when it dewed.

Note:

If the malfunction is not eliminated after checking the above items, or the malfunction is not shown in the above table, contact Sanyo sales representative or agent.

DISPOSAL OF UNIT

WARNING

If the unit is to be stored unused in an unsupervised area for an extended period **ensure that children do not have access and doors cannot be closed completely.**

The disposal of the unit should be accomplished by appropriate personnel. Always remove doors to prevent accidents such as suffocation.

Recycle of battery



The unit contains a rechargeable battery. The battery is recyclable. At the end of its useful life, check with your local solid waste officials for proper disposal.



* Label indication is obliged to comply with Taiwanese battery regulation.

DISPOSAL OF UNIT

(English)

FOR EU USERS

The symbol mark and recycling systems described below apply to EU countries and do not apply to countries in other areas of the world.

Your SANYO product is designed and manufactured with high quality materials and components which can be recycled and/or reused.

The symbol mark means that electrical and electronic equipment, batteries and accumulators, at their end-of-life, should be disposed of separately from your household waste.

Note:

If a chemical symbol is printed beneath the symbol mark, this chemical symbol means that the battery or accumulator contains a heavy metal at a certain concentration. This will be indicated as follows: Hg: mercury, Cd: cadmium, Pb: lead

In the European Union there are separate collection systems for used electrical and electronic equipment, batteries and accumulators.

Please, dispose of them correctly at your local community waste collection/recycling centre.

Please, help us to conserve the environment we live in!

(German)

Für EU-Staaten

Das Symbol und das erwähnte Wiederverwertungssystem gelten nur für die Länder der EU und nicht für andere Länder oder Gebiete in der Welt.

Die Produkte von SANYO werden aus hochwertigen Materialien und Komponenten gefertigt, die sich wieder verwenden lassen.

Das Symbol bedeutet, dass elektrische oder elektronische Geräte, Batterien und Akkus am Ende ihrer Lebensdauer nicht im Haushaltsmüll entsorgt werden dürfen.

Hinweis:

Ein chemisches Zeichen unter dem Symbol bedeutet, dass die Batterie bzw. der Akku Schwermetalle in gewissen Konzentrationen enthält. Die Metalle werden wie folgt bezeichnet: Hg: Quecksilber, Cd: Kadmium, Pb: Blei

In der Europäischen Union gibt es separate Sammelstellen für elektrische und elektronische Geräte, Batterien und Akkus.

Entsorgen Sie solche Geräte bitte richtig in der kommunalen Sammelstelle bzw. im Recyclingzentrum.

Helfen Sie mit, die Umwelt in der wir leben, zu schützen.



DISPOSAL OF UNIT

(French)

POUR LES UTILISATEURS DE UE

Le symbole et les systèmes de recyclage évoqués ci-dessous s'appliquent uniquement aux pays de UE.

Votre produit SANYO est conçu et fabriqué avec des composants et des matériaux de hautes qualités qui peuvent être recyclés et/ou réutilisés.

Le symbole signifie que les équipements électriques et électroniques, les batteries et les accumulateurs ne doivent pas être mis au rebut avec les déchets domestiques à l'issue de leur durée de vie.

Remarque:

Si un symbole chimique est imprimé sous le symbole, le symbole chimique indique que la batterie ou l'accumulateur contient une certaine concentration de métaux lourds. Les métaux sont indiqués de la manière suivante: Hg: mercure, Cd: cadmium, Pb: plomb.

Il existe différents systèmes de collecte pour les équipements électriques et électroniques, les batteries et les accumulateurs usagés au sein de l'Union européenne.

Veuillez mettre les équipements au rebut de manière correcte, auprès de votre centre de recyclage/de collecte des déchets local.

Aidez-nous à préserver l'environnement dans lequel nous vivons!

Les machines ou appareils électriques et électroniques contiennent fréquemment des matières qui, si elles sont traitées ou éliminées de manière inappropriée, peuvent s'avérer potentiellement dangereuses pour la santé humaine et pour l'environnement.

Cependant, ces matières sont nécessaires au bon fonctionnement de votre appareil ou de votre machine. Pour cette raison, il vous est demandé de ne pas vous débarrasser de votre appareil ou machine usagé avec vos ordures ménagères.

(Spanish)

PARA USUARIOS DE LA UNION EUROPEA

El símbolo y los sistemas de reciclado descritos a continuación se aplican para países de la Unión Europea y no se aplica para países en otras áreas del mundo.

Su producto SANYO fue diseñado y fabricado con materiales de alta calidad y componentes que pueden ser reciclados y/o vueltos a usar.

El símbolo significa que los equipos eléctricos y electrónicos, baterías y acumuladores, al final de su vida útil, debe ser desechados separadamente de sus residuos domiciliarios.

Nota:

Si hay un símbolo químico impreso debajo del símbolo, este símbolo químico significa que la batería o acumulador contiene una cierta concentración de un metal pesado. Esto es indicado de la siguiente manera: Hg: mercurio, Cd: cadmio, Pb: plomo

En la Unión Europea hay sistemas de recolección separados para equipos eléctricos y electrónicos, baterías y acumuladores usados.

Por favor, disponga de ellos correctamente en el centro de recolección de residuos/reciclado de la comunidad de su localidad.

Por favor, ayúdenos a proteger el medio ambiente en que vivimos!



DISPOSAL OF UNIT

(Portuguese)

PARA UTILIZADORES DA UE

O símbolo e os sistemas de reciclagem descritos abaixo aplicam-se aos países da UE e não se aplicam aos países noutras áreas do mundo.

O seu produto SANYO foi concebido e fabricado com materiais e componentes de elevada qualidade que podem ser reciclados e/ou reutilizados.

O símbolo significa que o equipamento eléctrico e electrónico, baterias e acumuladores, em final de vida, não devem ser deitados fora juntamente com o lixo doméstico.

Atenção:

Se estiver impresso um símbolo químico debaixo do símbolo de , este símbolo químico significa que a bateria ou acumulador contém um metal pesado numa determinada concentração. Estará indicado da seguinte forma: Hg: mercúrio, Cd: cádmio, Pb: chumbo

Na União Europeia existem sistemas de recolha separados para equipamento eléctrico e electrónico, baterias e acumuladores.

Por favor, entregue-os no seu centro de reciclagem/recolha de lixo local.

Por favor, ajude-nos a conservar o ambiente!

(Italian)

PER UTENTI UE

Il simbolo e i sistemi di riciclaggio descritti di seguito si applicano esclusivamente ai paesi dell'UE.

Questo prodotto SANYO è stato progettato e realizzato con materiali e componenti di elevata qualità che possono essere riciclati e/o riutilizzati.

Il simbolo di riciclaggio mostrato di seguito indica che i dispositivi elettrici ed elettronici, le batterie e gli accumulatori, una volta esauriti, devono essere smaltiti separatamente rispetto ai rifiuti domestici.

Nota:

Se sotto il simbolo di riciclaggio appare un simbolo chimico, esso sta ad indicare che la batteria o l'accumulatore contengono metalli pesanti a determinate concentrazioni. Questo viene specificato come segue: Hg: mercurio, Cd: cadmio, Pb: piombo.

Nell'Unione europea esistono diversi sistemi per la raccolta dei rifiuti speciali quali i dispositivi elettrici ed elettronici, le batterie e gli accumulatori.

Si raccomanda di provvedere allo smaltimento di tali rifiuti secondo quanto previsto dalle normative vigenti in materia.

Aiutaci a conservare l'ambiente!



DISPOSAL OF UNIT

(Dutch)

VOOR GEBRUIKERS IN DE EU

Het symbool en de recycleersystemen die hieronder beschreven worden, zijn van toepassing op de landen in de EU en zijn niet van toepassing op landen in andere delen van de wereld.

Uw SANYO product is ontworpen en gemaakt met materialen en onderdelen van hoge kwaliteit, die gerecycleerd en opnieuw gebruikt kunnen worden.

Het symbool betekent dat elektrische en elektronische apparatuur, batterijen en accu's aan het eind van hun leven apart van uw huisafval weggegooid moeten worden.

Let op:

Indien een chemisch symbool afgedrukt staat onder het symbool, betekent dit chemisch symbool dat de batterij of accu een zwaar metaal met een bepaalde concentratie bevat. Dit wordt als volgt aangegeven: Hg: kwik, Cd: cadmium, Pb: lood

In de Europese Unie zijn afzonderlijke inzamelingssystemen voor gebruikte elektrische en elektronische apparatuur, batterijen en accu's.

Wilt u deze op de juiste manier weggooien bij uw plaatselijk afvalinzameling-/recyclingcentrum in uw buurt?

Help ons het milieu waarin wij leven in stand te houden!

(Swedish)

FÖR ANVÄNDARE INOM EU

Den symbolmärkning och de återvinningssystem som beskrivs här nedan gäller länder inom EU och gäller inte länder i någon annan del av världen.

Din SANYO-produkt har konstruerats och tillverkats med delar och material av hög kvalitet, som kan återvinnas och/eller återanvändas.

Symbolmärkningen innebär att elektrisk och elektronisk utrustning, batterier och ackumulatorer, vid slutet av deras livslängd, inte får slängas som hushållsavfall utan skall slängas separat.

Observera:

Om en kemisk symbol finns tryckt under denna symbolmärkning, betyder denna kemiska symbol att batteriet eller ackumulatören innehåller en tungmetall med en viss koncentration. Detta indikeras på följande sätt: Hg: kvicksilver, Cd: kadmium, Pb: bly

I den Europeiska Unionen finns det separata uppsamlingssystem för använd elektrisk och elektronisk utrustning, batterier och ackumulatorer.

Gör dig av med sådana saker på rätt sätt på den speciella lokala platsen för återsamling/återanvändning.

Hjälp oss att bevara den miljö vi lever i!



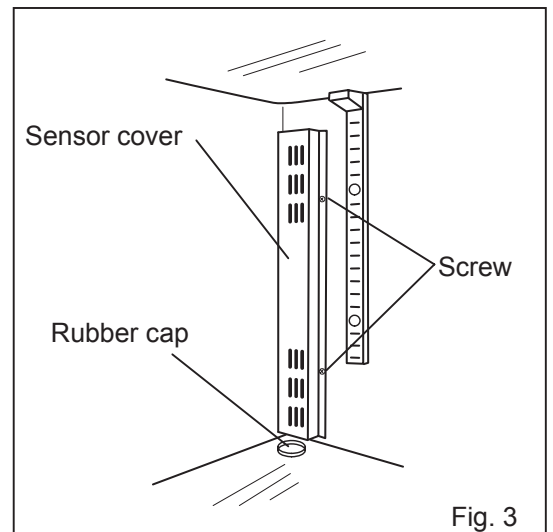
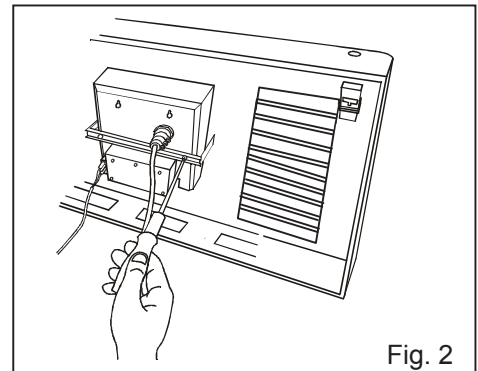
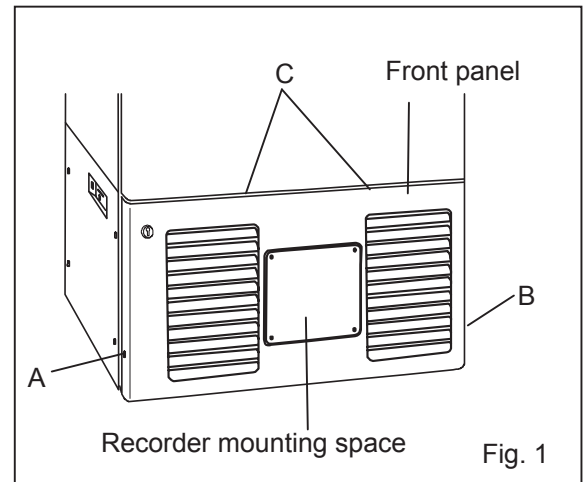
TEMPERATURE RECORDER (OPTION)

A temperature recorder is available for this freezer as the optional component. The type of the recorder is MTR-G85. Consult Sanyo sales representative or agent for the recorder installation. Following shows the attachment procedure.

1. Remove four screws on the front panel and take it off. (Fig. 1) By removing four screws, take off the front panel. Then take off the cover for the recorder mounting space by removing four screws.

2. As shown in the Fig. 2, insert the temperature recorder to the mounting space and fix it to the back side of the front panel by using the recorder fixture enclosed with the recorder.

3. Take off the sensor cover in the chamber (bottom left side) by removing two screws. Then remove the rubber cap and insulation covering the access port. (Fig. 3)



TEMPERATURE RECORDER (OPTION)

4. As shown in the Fig. 4, pass the recorder sensor through the sensor guide pipe from the front to the back. The sensor guide pipe is provided on the upper left side of the base compartment.

5. Remove the wire grille on the back bottom of the freezer.

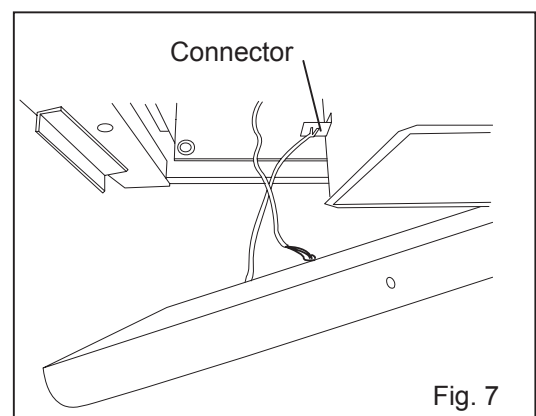
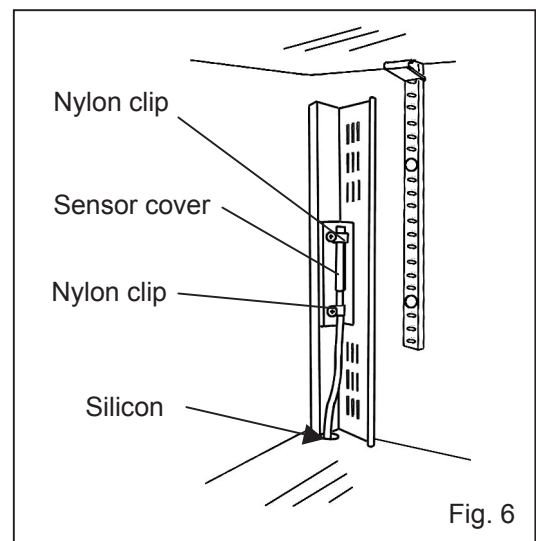
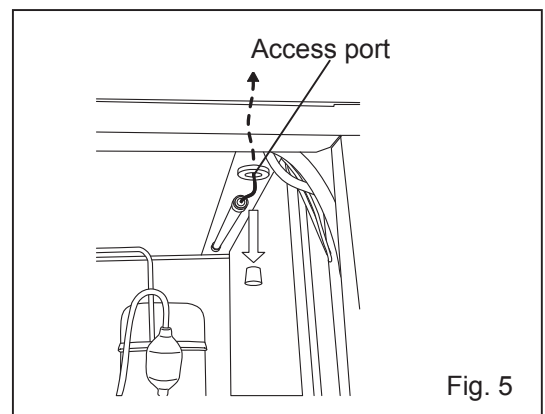
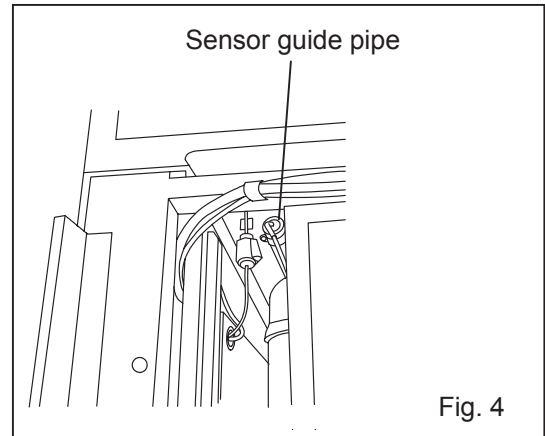
6. Take out the recorder sensor from the guide pipe at the back side and pass the recorder sensor to the chamber through the access port. (Fig. 5)

7. Attach the recorder sensor on the sensor cover with the enclosed clips. Seal the access port with a silicon and replace the recorder sensor cover. Fix the sensor cover to the inside wall. (Fig. 6)

8. Remove the connector cover. Connect the recorder connector at the end of the power cord with the white connector on the left of the base compartment. Bind the extra lead wire of the sensor with a nylon clip on the back of the recorder. (Fig. 7)

9. Replace the front panel and fix them with screws. Replace the wire grille on the back bottom of the freezer.

10. Operate the freezer until the chamber temperature gets to the set temperature. Check the recorded temperature and chamber temperature displayed on the control panel. Adjust the zero adjustment volume on the temperature recorder so that the recorded temperature can corresponds with the displayed temperature if they are not compliance each other.



BACK-UP SYSTEM (OPTION)

WARNING

As with any equipment that uses CO₂ gas, there is a likelihood of oxygen depletion in the vicinity of the equipment. It is important that you assess the work site to ensure there is suitable and sufficient ventilation. If restricted ventilation is suspected, then other methods of ensuring a safe environment must be considered. These may include atmosphere monitoring and warning devices.

This freezer can be provided with a back-up system (CVK-UB2) which is available as an optional component. For the installation, refer to the instruction manual enclosed with the system.

1. Switch of back-up system (BACKUP)

When turning on the system, the lamp is brightened. This means that the system is ready. To stop the operation of the system, turn off this switch.

2. Test switch (TEST)

This switch is for checking the operation of back-up system. Pressing this switch results in the release of liquid carbon dioxide without system operation.

3. Temperature setting knob (TEMP. SET)

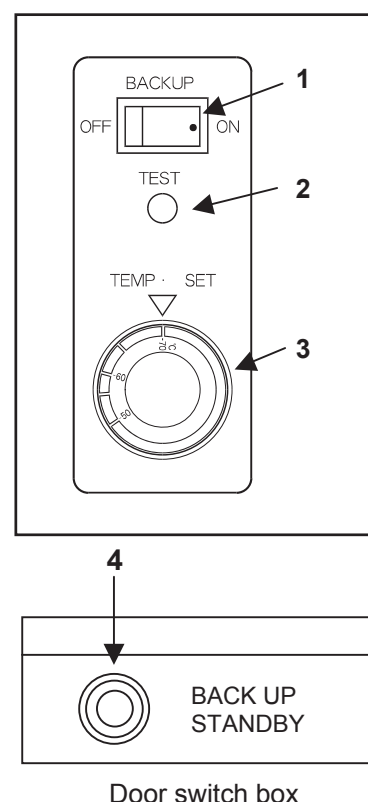
With this knob, set the temperature at which the system is operated. The effective set temperature range is between -50°C and -70°C.

Note:

Do not set the temperature setting knob to the temperature lower than -70°C to avoid the early consumption of CO₂ gas resulting from continuous injection.

4. Back-up standby lamp (BACK UP STANDBY)

This lamp is on/off in conjunction with the operation of back-up system.

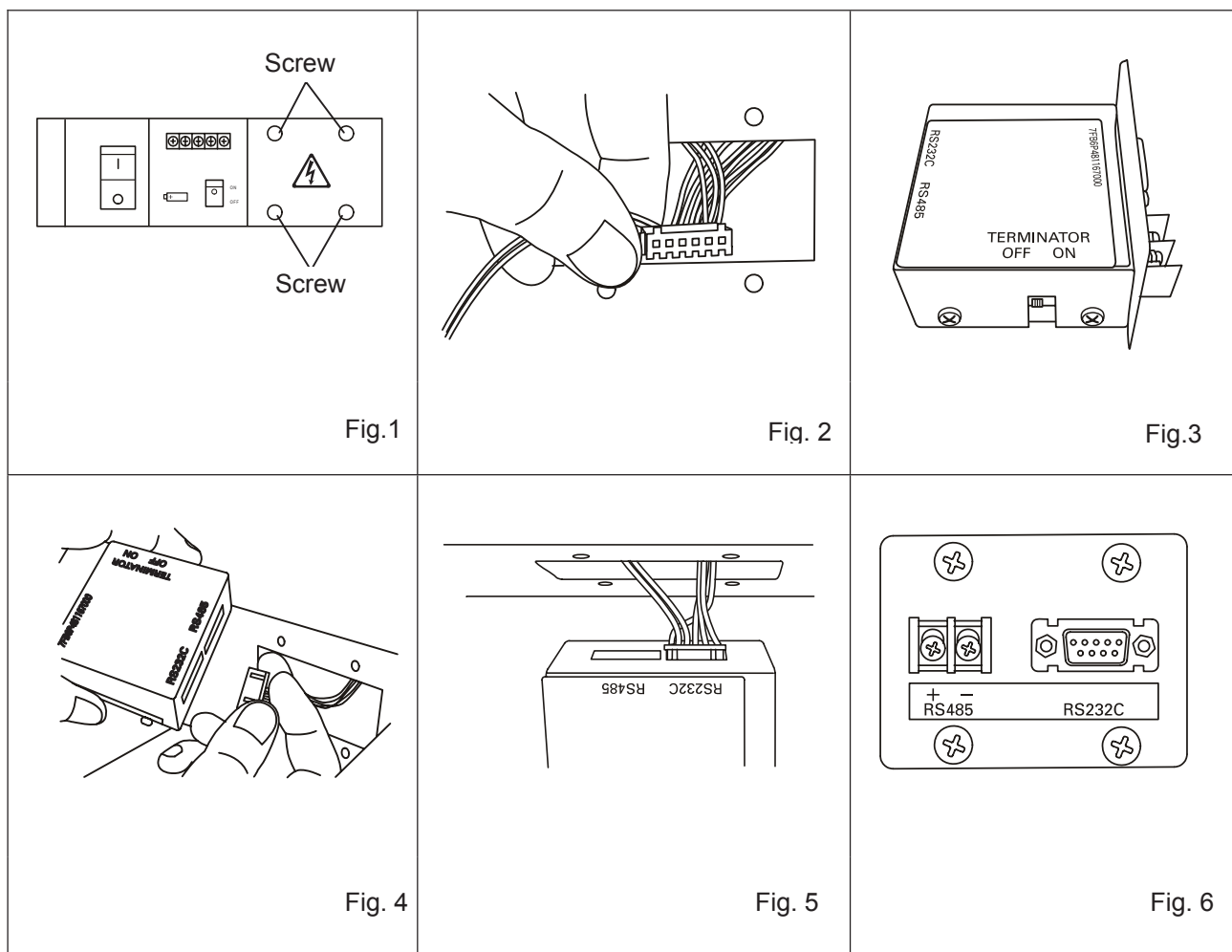


Door switch box

MOUNTING OF INTERFACE BOARD (OPTION)

By installing an interface board (MTR-480), the log data can be transmitted to a PC. The mounting procedure is as follows:

1. Remove 4 screws of the communication box hole cover in the control panel. (Fig. 1)
2. Provide an interface board (MTR-480) code from the fitting hole. (Fig. 2)
3. Refer to the instruction manual attached to the interface board for the setup of the TERMINATOR switch of the interface board (MTR-480). (Fig. 3)
4. Connect to the connector side (the back side of the interface board) of a communication cable (RS-232C or RS-485) to use for the interface board (MTR-480). (Fig. 5 is a connection example to use RS-232C.) (Fig. 4 and 5)
5. Fix an interface board (MTR-480) on the control panel with 4 screws. (Fig. 6)

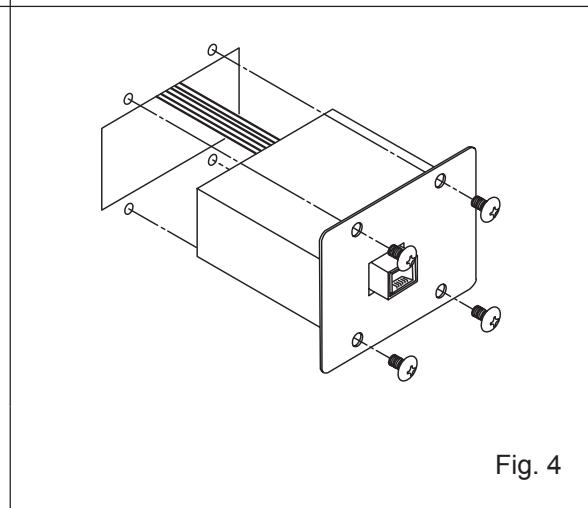
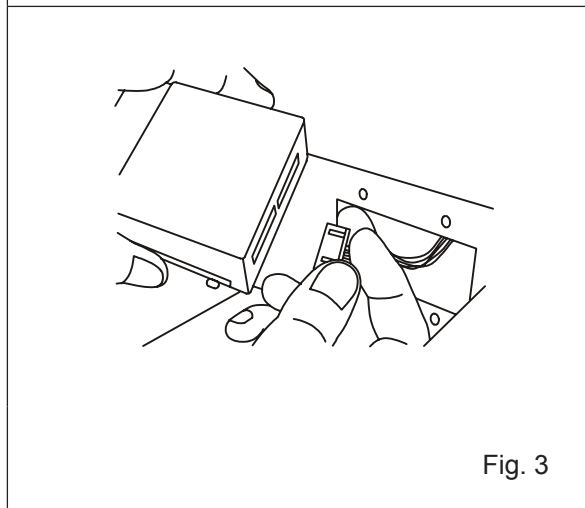
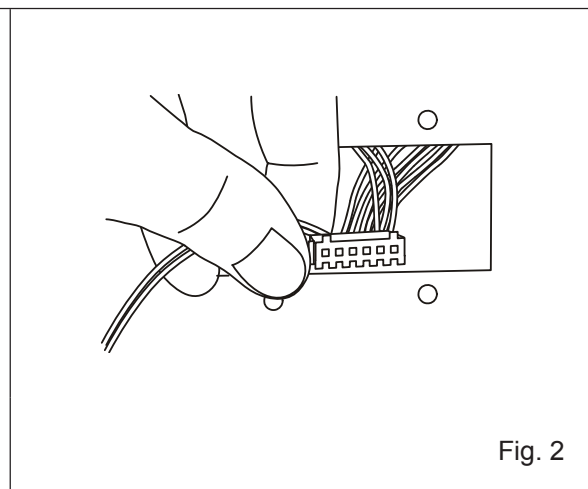
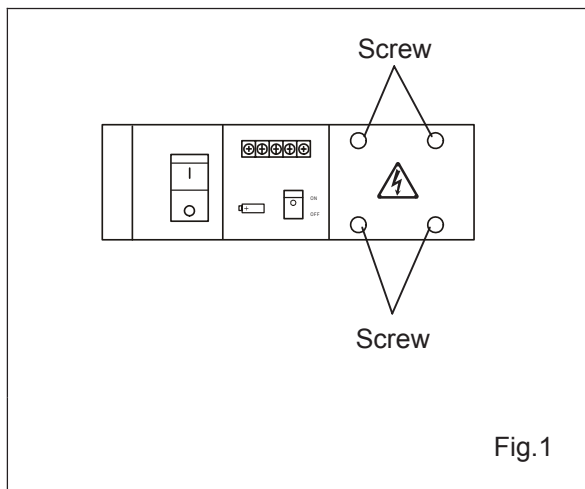


* When a data transmitting function to the personal computer is done, an interface board MTR-480 (option goods) and communication cable of 9 pin Dsub cross type for RS232C are necessary.

MOUNTING OF LAN INTERFACE BOARD (OPTION)

By installing an LAN interface board (MTR-L03), the log data can be transmitted to a PC. The mounting procedure is as follows:

1. Remove 4 screws of the communication box hole cover in the control panel. (Fig. 1)
2. Provide an LAN interface board (MTR-L03) code from the fitting hole. (Fig. 2)
3. Connect to the connector side (the back side of the LAN interface board) of a connector cable to use for the LAN interface board (MTR-L03). (Fig. 4 is a connection example to use) (Fig. 3 and Fig. 4)
5. Fix an LAN interface board (MTR-L03) on the control panel with 4 screws.



Note:

The connecting cable between the PC and MTR-L03 terminal is not enclosed. Provide a cross type cable of less than 100 m length having a pin plug.

SPECIFICATIONS

Name	Ultra-Low Temperature Freezer	
Model	MDF-U500VX	MDF-U500VXC (for USA only)
External dimensions	W770 x D870 x H1990 (mm)	
Internal dimensions	W630 x D600 x H1380 (mm)	
Effective capacity	519 L	
Exterior	Painted steel	
Interior	Painted steel	
Outer door	Painted steel	
Inner door	ABS resin panel with stainless frame, 2 doors	
Shelf	Stainless steel, 3 shelves (adjustable) Inner dimension; W608 x D533 (mm), Load; 50 kg/shelf	
Access port	17 mm diameter, 3 locations (back, 2 bottoms)	
Insulation	Vacuum insulation panel + Rigid polyurethane foamed-in place	
Compressor	A side; Hermetic type, Output; 1100 W B side; Hermetic type, Output; 1100 W	
Evaporator	Tube on sheet type	
Condenser	Finless tube type	
Refrigerant	HFC mixed refrigerant	
Temperature controller	Microcomputer control system	
Temperature display	Digital display	
Thermal sensor	Platinum resistance (Pt 1000 Ω)	
Alarm	High temp. alarm, Low temp. alarm, Power failure alarm, Door alarm, Sensor abnormality, Fan motor abnormality, Compressor temp. abnormality, Cooling circuit abnormality	
Remote alarm contact	Allowable contact capacity: DC 30 V, 2 A	
Battery	Nickel-metal-hydride battery, DC 6 V, 1100 mAh, Auto-recharge (5HR-AAC)	
Weight	320 kg	328 kg
Voltage booster	None	Built-in
Optional component	Automatic temperature recorder + Mounting kit (MTR-85H + MDF-S3085) Interface board (MTR-480), LAN interface board (MTR-L03) Aluminum container (IR-220U, MDF-224U) Back-up system (CVK-UB2, CVK-UB2(I)): LCO ₂	

Note:

- Design or specifications will be subject to change without notice.
- The battery for power failure alarm is an article for consumption. It is recommended that the battery will be replaced about every 3 years. Contact Sanyo sales representative or agent at the time of replacement of the battery for recycling.
- About 3 days operation of a freezer is necessary to full charge the battery.
- Fan motors are expendable supplies. Exchange it for about every 6 years. Contact Sanyo sales representative or agent at the time of replacement of the fan motor.
- When a data transmitting function to the personal computer is done, an interface board MTR-480 (option) and communication cable of 9 pin Dsub cross type for RS232C are necessary.
- When a data transmitting function to the personal computer is done, an LAN interface board MTR-L03 (option) and the cross type cable of less than 100 m length having a pin plug for LAN cable are necessary.

PERFORMANCE

Model	MDF-U500VX			
Cooling performance	-80°C at the center of the chamber (ambient temperature; 30°C, no load)*			
Temperature control range	-50°C to -86°C (ambient temperature; 30°C, no load)			
Power source	220 V, 50 Hz	220 V, 60 Hz	230 V, 50 Hz	240 V, 50 Hz
Rated power consumption	1140 W	1400 W	1185 W	1240 W
Noise level	53 dB [A] (background noise; 20 dB)			
Maximum pressure	2920 kPa			

Note :

- Specifications will be subject to change without notice.
- The unit with CE mark complies with EC directives 89/336/EEC, 93/68/EEC and 73/23/EEC

Model	MDF-U500VXC			
Cooling performance	-80°C at the center of the chamber (ambient temperature; 30°C, no load)*			
Temperature control range	-50°C to -86°C (ambient temperature; 30°C, no load)			
Power source	220 V, 60 Hz			
Rated power consumption	1400 W			
Noise level	53 dB [A] (background noise; 20 dB)			
Maximum pressure	2920 kPa			

Note :

- Specifications will be subject to change without notice.

CAUTION

Please fill in this form before servicing.
Hand over this form to the service engineer to keep for his and your safety.

Safety check sheet

1. Freezer contents : ☐ Yes ☐ No
Risk of infection: ☐ Yes ☐ No
Risk of toxicity: ☐ Yes ☐ No
Risk from radioactive sources: ☐ Yes ☐ No

(List all potentially hazardous materials that have been stored in this unit.)

Notes :

2. Contamination of the unit:

- Unit interior: ☐ Yes ☐ No
No contamination: ☐ Yes ☐ No
Decontaminated: ☐ Yes ☐ No
Contaminated: ☐ Yes ☐ No
Others:

3. Instructions for safe repair/maintenance of the unit

- a) The unit is safe to work on ☐ Yes ☐ No
b) There is some danger (see below) ☐ Yes ☐ No

Procedure to be adhered to in order to reduce safety risk indicated in b) below.

Date :

Signature :

Address, Division :

Telephone :

Product name: Ultra-low temperature freezer	Model: MDF-U500VX MDF-U500VXC	Serial number:	Date of installation:
---	-------------------------------------	----------------	-----------------------

Please decontaminate the unit yourself before calling the service engineer.



SANYO Electric Co., Ltd
Printed in Japan